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THE GEOGRAPHICAL IDENTIFICATION  
OF REGIONAL GROWTH CENTRES  
AND DEVELOPMENT REGIONS  
IN SOUTHERN ONTARIO





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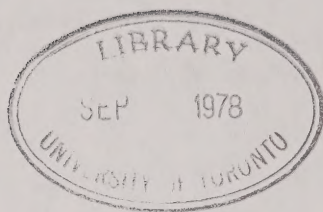
GEOGRAPHIC IDENTIFICATION  
OF REGIONAL GROWTH CENTRES AND DEVELOPMENT REGIONS  
IN SOUTHERN ONTARIO

A Report to the Regional Development Branch  
Department of Economics and Development  
Province of Ontario

Hans Carol, Chairman  
Department of Geography  
York University, Toronto

Toronto, November 1966





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REPORT

DATE: 10/10/1964

1

TO: Mr. J. Edgar Hoover, Director, Federal Bureau of Investigation

FROM: Mr. [Name], [Title], [Agency]

SUBJECT: [Subject]

REFERENCE: [Reference]

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## PREFACE

This study grew out of my contact with Dr. Ian Macdonald, Chief Economist of the Department of Economics and Development, to whom I had expressed my criticism of the delimitation of Ontario's ten Economic Regions. After several meetings with Messrs. Macdonald, Honey and other members of the Department of Economics and Development, a pilot project was agreed upon. Field work for this exploratory study was to be completed during the summer of 1966. A final report was to be submitted in the fall. The term "pilot study" was used to emphasize its exploratory character.

With the limited means and the briefness of the research period only some of the most essential work could be done. The findings of this exploratory study could provide the basis for a more elaborate and comprehensive research project through which the findings of this report could be checked, refined or refuted and a set of workable development regions determined. Such a research project would have to take into particular account the variables which have caused the present pattern and which will cause future change. It would also have to test the regionalization proposed in this study from the point of view of usefulness for administrative purposes and political feasibility.

I am indebted for the help received from my part-time research assistants: Mr. Fred Fuchs, Mrs. Barbara Hill and Mrs. Marta Kostyniuk. The resources of York University's Department of Geography were used; in particular, the services of Mrs. Charlotte Carol, who did the map-drawing, and of Mrs. Jean Rees and Miss Anne Conte, who did the typing, are appreciated.

I am grateful for the amiable co-operation of Mr. Peter Honey, Co-ordinator of Research, Regional Development Branch.





## I PURPOSE AND PROBLEM

The purpose of the pilot study project can be expressed in the following terms:

"The research project will attempt: (a) to identify regional growth centres of middle order with their functional service areas; (b) to identify metropolitan or high order centres together with their service areas; (c) to compare, evaluate and make recommendations as to the suitability of several alternative regionalizations of the Province of Ontario for the purposes of regional economic development. For the purposes of this section the regions to be considered are those implicit in sections (a) and (b) above and the present ten economic regions of Ontario. The study area will be that portion of the Province of Ontario south of the French River."

The limited objectives of this pilot study have been interpreted as part of the wider frame of Ontario's Regional Development Policy. In a policy statement on April 5, 1966 the Prime Minister cited nine key points in this policy. Of these, three have particular relevance to this project; points five, seven and nine:

"Five is the preparation for comprehensive regional economic research through the Regional Development Branch of the Department of Economics and Development."

"Seven is our expectation that our comprehensive research programme will provide the necessary insight required to formulate development plans based on the concept that regional growth centres are the unifying social and economic force within the region."

"Nine is our intention to work toward the gradual establishment of common administrative and planning regions among the operating departments and agencies of the provincial government."

The conclusions of the Prime Minister's statement mention particularly two pertinent thoughts:

- (1) "We shall be seeking means of ensuring that people in all parts of the province share in the benefits of economic and social development."
- (2) "That regional development will be looked upon as an integral part of this government's contribution to the development of the province as a whole."



Thus the purpose of this study can be stated as an attempt to define a set of regions which aim at maximization of the benefits of economic development for the province as a whole. In terms of the location of economic activity, this maximization of economic development could be achieved in various ways as expressed in the following three basic concepts of spatial development:

"extreme decentralization"

"concentrated decentralization"

"extreme concentration".

The concept of "extreme decentralization" follows the premise that it is most desirable that every town receive a direct share of economic growth. The desirability of this principle rests in the hope of bringing more economic opportunities to all places thus providing the basis of future growth of population and tax revenue.

The concept of "extreme concentration" of economic activities might stipulate that the towns and small cities are remnants of an agrarian society and that future economic development will inevitably benefit the large city, the metropolis and operate against the direct growth and prosperity of smaller places.

The concept of "concentrated decentralization" lies between extreme concentration and extreme decentralization. Locational advantages of the metropolis and the city over the village and the town are recognized and consequently a trend toward concentration is encouraged. But it is also recognized that the widely spread rural population as well as the population of the small urban centres needs access to such major urban foci in order to optimize their economic and cultural life.





In order to obtain maximum benefits of the tremendous investments which were made by previous generations (in terms of farms, villages, towns, cities, roads, railroads, etc.) in Ontario, new technological trends cannot be located solely in accordance with their contemporary locational factors but have to be related to the existing pattern of the environment. For this reason the concept of concentrated decentralization appears the most reasonable and progressive alternative for the decades to come. The concept places considerable emphasis on fostering complementary relationships between central places and their hinterlands. This approach to fostering viable, prospering growth centres in various parts of Ontario should not be seen merely as giving the cities preferences which ought to be directed toward the towns and villages; the city serves as a centre of employment for its rural hinterland. Thus economic development of the growth poles stimulates the wellbeing of the population of the whole province. The city with a population of at least several tens of thousands can, in conjunction with the metropolitan centres, provide urban functions which are demanded by the people of the present and next generation - functions which cannot be provided from smaller towns and villages. With our great private mobility, services which the city and metropolises provide are also at the disposition of the rural population of the city's hinterland. The functional unit of the city and its hinterland is the basic unit which should underlie Development regions.

The basic hypothesis of this study is that certain cities do at present in fact serve as regional centres and should purposefully be chosen as regional growth poles and centres of Development regions.





The research problem involved in this study is twofold: First, to identify cities which could qualify as growth poles, in other words, to identify certain levels of an urban hierarchy. Second, to translate the actual geographic pattern of cities and their tributary areas - the functional regions - into a set of precisely delimited Development regions.

For the first part of the report, on geographic identification of functional regions, central place theory<sup>1</sup> provides a theoretical model. A great many empirical studies all over the world have been produced and a fund<sup>2</sup> of empirical research methods has been created. In Ontario several<sup>3</sup> studies regarding certain aspects of central functions have been made but to this researcher's knowledge no study is available which would provide the kind of basic information required to solve the problem of defining a pattern of Development regions.

The report as a whole is divided into Part A: The Main Report and Part B: The Appendices. The appendices contain a detailed account of methodology, procedures and findings of five specific aspects of the survey. The Main Report presents the whole survey, its methods and findings, in a comprehensive form, including the maps as integral parts of the findings.

It begins with a case study designed to introduce the reader to the trip behaviour of the rural population with their neighbouring cities using as examples Oshawa, Peterborough, Belleville and Kingston. Also, the trips made to two metropolitan centres, Ottawa and Toronto, were recorded and are discussed. This field study was conducted by means of personal interviews. The trip behaviour discerned clearly indicated a hierarchical relationship of three levels between cities and hinterlands: a



high order level, expressed in trips to metropolitan centres like Ottawa and Toronto; a middle order level, expressed in trips to city-centres like Peterborough and Belleville; and a low order level, expressed in trips to such town-centres as Lindsay, Coburg and Picton.

In order to determine such functional relationships throughout southern Ontario, instead of using the high-cost personal interview method, a questionnaire survey was conducted for the whole study area. The results of the questionnaire survey could be checked and verified against the findings in the Oshawa-Kingston case study and also against the traffic pattern which was plotted on maps.

Based on the identified cities and their tributary areas, the main task of the study could now be undertaken: the identification of precisely delimited Development regions. A two level hierarchy is proposed: four Development regions of high order centred upon four metropolises as their hubs and nineteen Development regions of middle order, centred on cities and metropolises.

Finally, several alternatives to the proposed regional configuration are discussed and Ontario's ten Economic regions are critically evaluated. It is recommended that the authorities of the Province study the suitability of the proposed pattern of Development regions not only as a framework for economic development and for provincial administration but also as a possible basis for regional government.





Footnotes (Purpose and Problem)

1. Christaller, W., Central Places in Southern Germany, translated by C.W. Baskin, Prentice Hall, Englewood Cliffs, 1966.
  2. Berry, B.J.L., Barnum, H.G. and Tennant, R.J., Retail Location and Consumer Behaviour, Papers of the Regional Science Association, Vol. 9, 1962, pp. 65-106.
- Carol, H., Industrie und Siedlungsplanung, Plan, Revue Suisse d'Urbanisme, Vol. 8, No. 6, 1951, pp. 191-206.
- Carol, H., The Hierarchy of Central Functions within the city, Annals of the Association of American Geographers, Vol. 50, 1960, No. 4, pp. 419-438.
3. Goheen, P.G., The Central Places of Southern Ontario: a geographic study of their external relations, M.A. Thesis, Clark University, Worcester, Mass., 1964 (manuscript).
- Ray, D.M., Cultural Differences in Consumer Travel Behaviour in Eastern Ontario, Paper presented to the Annual Meeting of the Canadian Association of Geographers, Sherbrooke, 1966, (10 pages, 10 figures).
- Spelt, J., The Urban Development in South-Central Ontario, Van Gorcum, Assen, Holland, 1955.



## II THE FUNCTIONAL DIVERSITY OF THE LAKE ONTARIO ECONOMIC REGION (A CASE STUDY)

The Lake Ontario Economic Region was selected for detailed field studies of the tributary areas of its major cities, Peterborough and Belleville, which lie within the region, and Oshawa and Kingston, which are situated outside but influence the population along the borders of the region. The methods used and results obtained are fully described in Appendix II. Here only some major features are presented.

Primary data was collected through personal interviews of clusters of 3-5 residents at one place; such clusters were spaced at intervals of 3-7 miles along roads which connect the above-mentioned cities. A total of 194 interview sheets (Exhibit 1) were completed in which the number of trips made in 1965 by the interviewed person to the neighbouring cities as well as to Toronto and Ottawa was recorded.

With present-day private mobility, one would expect a broad and rather indistinct transitional zone between two neighbouring cities. Surprisingly enough, the accessibility factor does play a decisive role as the diagrams of trip behaviour between Oshawa and Peterborough, Peterborough and Belleville, and Belleville and Kingston show (Exhibit 2). The diagrams highlight, particularly in the case of the Peterborough-Belleville route, a "plateau" of over 90 per cent of trips to the nearest city stretching over 10-20 miles, followed by a relatively gentle transition to the 75 per cent level followed by a more rapid transition to the halfway point. This point does not usually coincide with a point equidistant between the two cities but depends on accessibility of the neighbouring cities and on the greater pulling power of the more important city over its





Air-Force Mechanic  
Some High-School  
medium income

Questionnaire  
Service Area of Cities  
Department of Geography  
York University, Toronto

Permanent Residents Only

Location: Lot, Conc.: Village of  
Township,: STIRLING  
County: Front Street

1a) How many trips did you make to any of the following cities in 1965?

Belleville 1/WK Kingston — Oshawa — Peterborough 3/YR Lindsay — Others TRENTON

1b) Average number of trips per year; same as above? ✓ If not, indicate —

2a) How many trips did you make to Toronto (Ottawa) in 1965?

Toronto 1/YR Ottawa —

2b) Average number of trips per year; same as above? ✓ If not, indicate —

3 What is the purpose of these trips?

BEL KIN OSH PET LIND TOR OTT OTHERS

a) Retail trade (shopping, etc.)

✓ ✓

b) Service Trade

i) professional (lawyers, C.A., etc.) —

ii) health and welfare  
(doctor, hospital, etc.)

✓

iii) recreational, cultural,  
(theatre, movie, etc.)

✓

c) governmental (Ag.Rep., County)

d) personal relations

✓

e) others (specify) —

4a) Of the total amount of money which you spent in the cities listed above, what proportion did you spend in each separately? (1/3, 1/2, 2/3, 3/4)

BEL 9/10 KIN — OSH — PET 1/10 LIND — TOR — OTT — Others TRENTON

4b) How much money is that proportion in dollars? —

5) How many of your friends and neighbours generally go to the same cities?

All? ✓ Most? — Few? — (reasons)

BEL.



neighbours. (Oshawa: \$76 million retail sale; Peterborough: \$64 million; Belleville: \$45 million; Kingston: \$74 million.)

The same feature can be observed on the map (Exhibit 3) which shows the core area (over 75 per cent of the trips) and the 50 per cent boundaries. The core area appears surprisingly wide even in the more densely settled areas, while the transitional zone between the two cores is surprisingly narrow. The core area of Peterborough comprises 116,000 people, of which 47,000 live in the municipality of Peterborough, and the rest, 69,000, in the tributary area. The equivalent figures for the core area of Belleville are 105,000, 31,000 and 74,000 respectively (Exhibit 4).

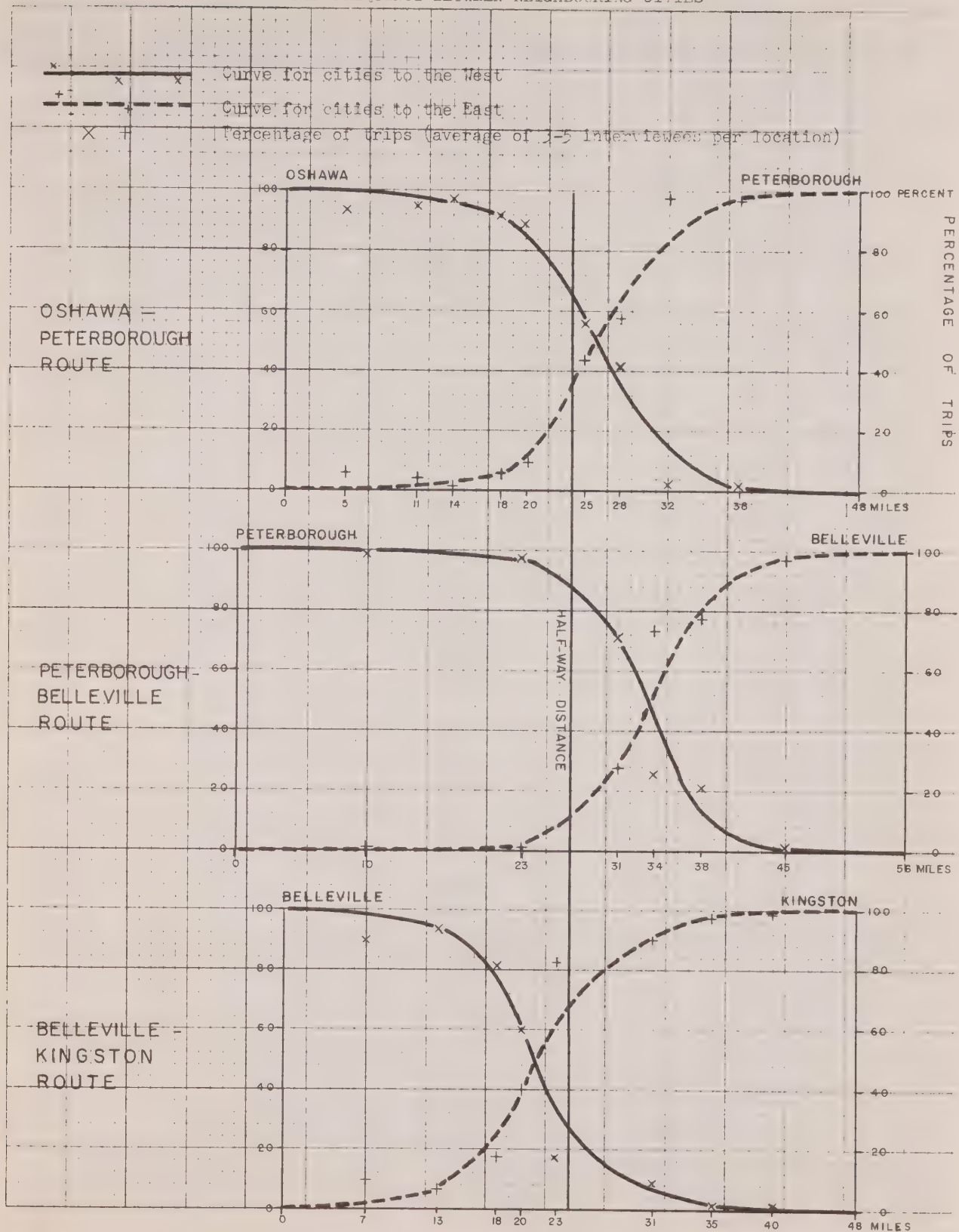
This field survey shows clearly that the Lake Ontario Economic Region does not possess any one single focal point: that it is not a single functional region. Rather, it is composed of two complete functional regions of middle order: the very large but thinly populated Peterborough region and the smaller Belleville region. The southwestern part of the Economic region is strongly tied to Oshawa and the southeastern part to Kingston. Thus the Lake Ontario Economic Region falls into the orbit of four centres of middle order; it does not possess the quality of a functional unit as proposed by the originators of the system of Economic Regions of Canada.

The interview survey revealed two points of general interest to this study: the decrease of trip frequency with distance from the city and the differences in trip behaviour by socio-economic groups. Although the results are derived from very small samples it is felt that they should nevertheless be presented since they provide some insight into how regions function in southern Ontario.





TRIP FREQUENCY BETWEEN NEIGHBOURING CITIES





CENTRAL LAKE  
ONTARIO ECONOMIC REGION



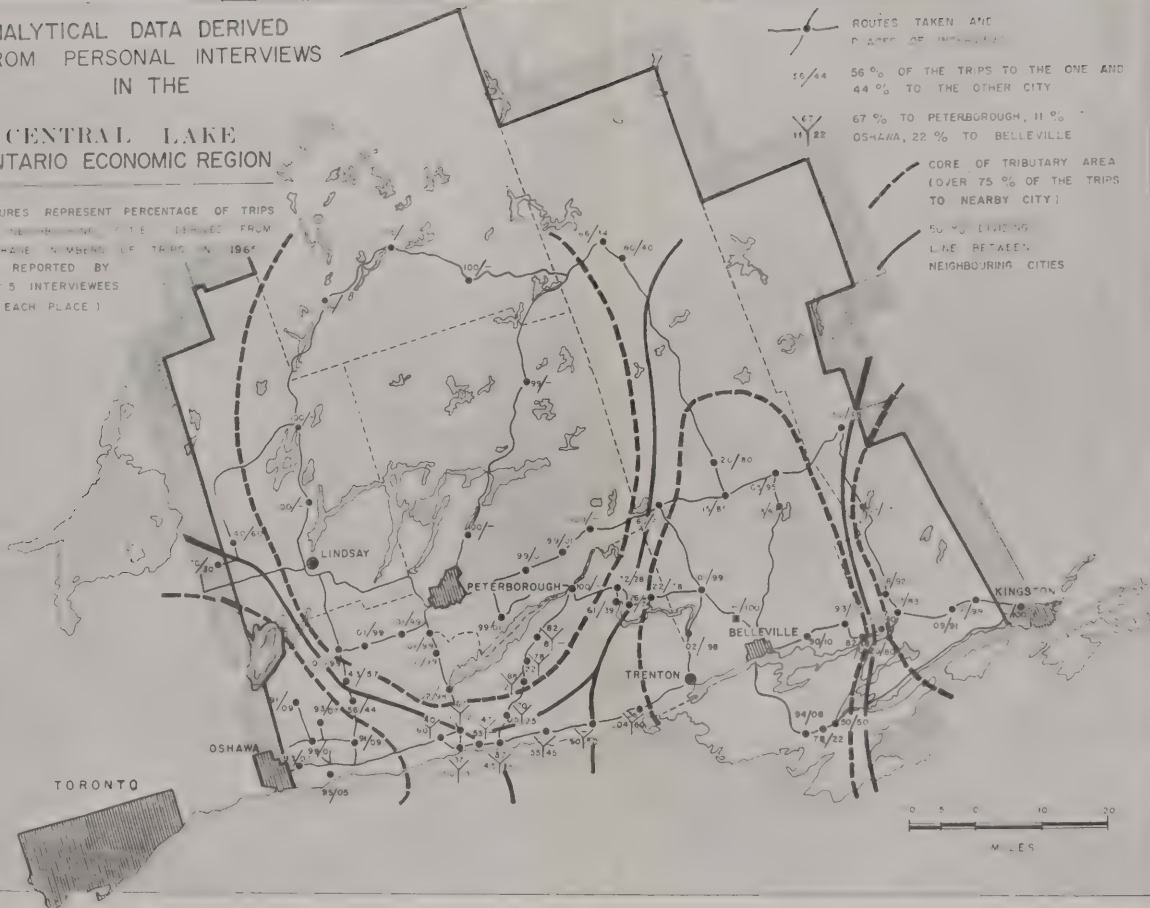
ROUTES TAKEN AND  
PLACES OF INTEREST

16/44

67  
11 22

CORE OF TRIBUTARY AREA  
(OVER 75 % OF THE TRIPS  
TO NEARBY CITY)

50 MILES  
LINE BETWEEN  
NEIGHBOURING CITIES







# CITIES AND THEIR TRIBUTARY AREAS OF MIDDLE ORDER CENTRAL FUNCTIONS IN THE CENTRAL LAKE ONTARIO ECONOMIC REGION





The total number of trips by concentric zones from the core areas of Peterborough and Belleville diminished as follows:

| Zones<br>Miles | number<br><u>Average/of trips per person per year to:</u> |    |            |    |
|----------------|---|----|------------|----|
|                | Peterborough  |    | Belleville |    |
|                | 1   | 2  | 1          | 2  |
| Up to 10       | 11  | 65 | 12         | 40 |
| 10 - 20        | 19  | 24 | 20         | 27 |
| 20 - 30        | 12  | 19 | 10         | 18 |
| Over 30        | 13  | 14 | -          | -  |

- (1) Number of persons interviewed  
(2) Average number of trips per person.

In the case of Peterborough the trip numbers per year and persons interviewed diminishes from 65 for the inner zone to below 20 for a zone of about one hour's drive. The diagram (Exhibit 5) shows the relation of trip number and distance clearly.

The number of trips to cities and metropolises made by the interviewed persons in 1965 differed with their subjectively estimated socio-economic level as follows:

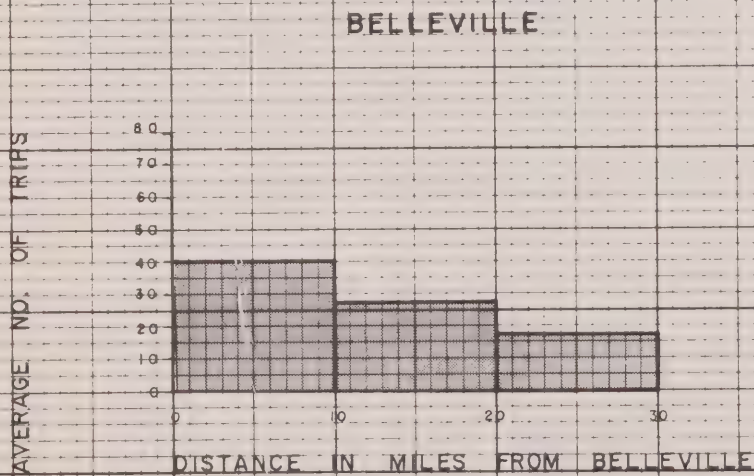
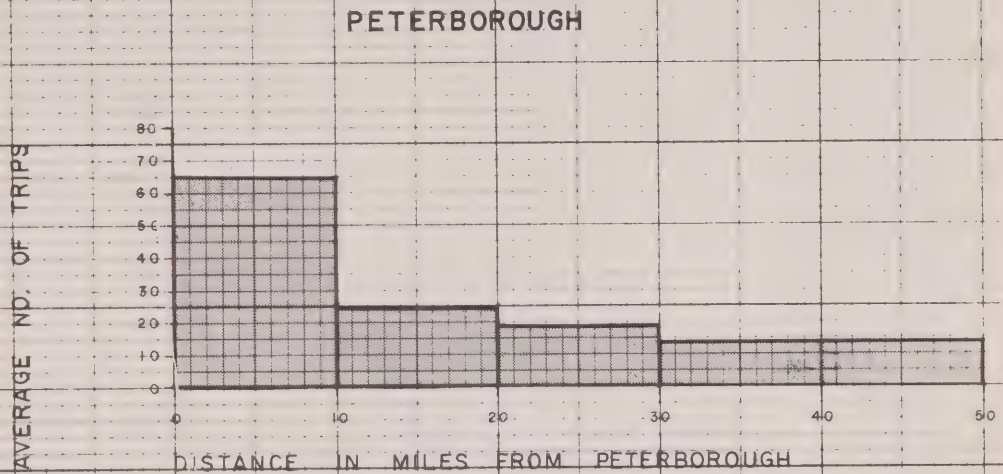
| <u>Estimated socio-economic level of<br/>Interviewed Persons</u> | <u>No. of Persons<br/>Interviewed</u> | <u>Number of trips in 1965 to:</u> |                                  |
|--|---------------------------------------|------------------------------------|----------------------------------|
|  |                                       | <u>Middle Order<br/>Cities (1)</u> | <u>High Order<br/>Cities (2)</u> |
| Below average income   | 70                                    | 49.2                               | 2.1                              |
| Average income   | 106                                   | 34.3                               | 5.0                              |
| Above average income   | <u>18</u>                             | <u>18.8</u>                        | <u>7.8</u>                       |
| Total  | <u>194</u>                            | <u>31.1</u>                        | <u>4.2</u>                       |

- (1) Oshawa, Peterborough, Belleville, Kingston  
(2) Toronto and to a minor degree, Ottawa.

The average number of trips to middle order centres was 31.1 while the average number of trips to Toronto was 4.12 and to Ottawa .14; the relation of Toronto to Ottawa being 96.6 to 3.4 per cent.





AVERAGE NUMBER OF TRIPS WITHIN CORE AREAS (75%) TO  
MIDDLE ORDER CENTRES BY CONCENTRIC DISTANCE ZONES



The percentage of people in the three socio-economic groups who in 1965 made no trips to a high order centre (Toronto or Ottawa) is most revealing:

No. of Persons  
Interviewed

|     |                      |               |
|-----|----------------------|---------------|
| 70  | Below average income | 35.3 per cent |
| 106 | Average income       | 18.1 per cent |
| 18  | Above average income | 0.0 per cent  |





### III IDENTIFICATION OF CITIES WHICH QUALIFY AS POTENTIAL CENTRES OF DEVELOPMENT REGIONS

As mentioned earlier, the main hypothesis of this study assumes that centres of potential development regions could be identified as cities which have, during the past, emerged as important service centres for their own and the surrounding populations. It is self-evident that large cities qualify; the real problem is how and where to define the lower threshold. In a thinly populated area a city of some 10,000-25,000 people may function as the overriding centre of a vast region, as is the case with Kenora or Owen Sound or North Bay. In the more densely settled lands larger and better equipped cities have emerged and the lower threshold may be above 25,000 people.

As elaborated in Appendix III, of all criteria tested, the most reliable statistical measure of a city's performance was found to be "total retail sales". The following is based on Dominion Bureau of Statistics data of cities and of metropolitan statistical areas of 1961. The map entitled "Cities and Metropolises in Ontario" (Exhibit 6) shows all of Ontario's 41 municipalities with a population of over 10,000 by circles proportionate to their total retail sales; retail sales are noted on the map in millions of dollars. The lowest figure shown is for Cobourg (\$14 million) while the highest figure is for Toronto (\$2,114 million) (Table 1).

Making use of the experience gained through the case study of Oshawa, Peterborough, Belleville and Kingston, a selection was made of cities which were most likely to perform comparable functions. Cities like Trenton, Cobourg and Lindsay perform merely a subsidiary role to the abovementioned cities and were therefore considered below the rank of



TABLE I  
CITIES OF OVER 10,000 PEOPLE IN ONTARIO BY POPULATION AND RETAIL SALE (1961)

| Cities of 10,000<br>Population and Over |                             | Population | Retail Sale<br>In 000 Dollars |
|---|-----------------------------|------------|-------------------------------|
| 1.                                      | Whitby                      | 14,685     | 13,415                        |
| 2.                                      | Cobourg                     | 10,646     | 13,659                        |
| 3.                                      | Port Colborne               | 14,886     | 16,497                        |
| 4.                                      | Kenora                      | 10,904     | 17,122                        |
| 5.                                      | Lindsay                     | 11,399     | 18,047                        |
| 6.                                      | Trenton                     | 13,183     | 18,684                        |
| 7.                                      | *Orillia                    | 15,345     | 21,479                        |
| 8.                                      | Owen Sound                  | 17,421     | 21,980                        |
| 9.                                      | *Pembroke                   | 16,791     | 23,689                        |
| 10.                                     | Stratford                   | 20,467     | 25,756                        |
| 11.                                     | Woodstock                   | 20,486     | 27,409                        |
| 12.                                     | Brampton                    | 18,467     | 27,527                        |
| 13.                                     | Brockville                  | 17,744     | 28,217                        |
| 14.                                     | Oakville                    | 10,366     | 28,340                        |
| 15.                                     | Galt                        | 27,830     | 30,219                        |
| 16.                                     | Timmins                     | 29,270     | 30,864                        |
| 17.                                     | St. Thomas                  | 22,469     | 31,923                        |
| 18.                                     | *Barrie                     | 21,169     | 37,973                        |
| 19.                                     | Welland                     | 36,079     | 39,033                        |
| 20.                                     | *North Bay                  | 23,781     | 39,657                        |
| 21.                                     | Niagara Falls               | 22,351     | 40,349                        |
| 22.                                     | *Chatham                    | 29,826     | 43,496                        |
| 23.                                     | *Belleville                 | 30,655     | 44,615                        |
| 24.                                     | *Cornwall                   | 43,639     | 45,301                        |
| 25.                                     | Guelph                      | 39,838     | 47,026                        |
| 26.                                     | Fort William                | 45,214     | 46,630)                       |
| 27.                                     | Port Arthur                 | 45,276     | 57,004)                       |
| 28.                                     | *Sarnia                     | 50,976     | 59,699                        |
| 29.                                     | *Brantford                  | 55,201     | 63,181                        |
| 30.                                     | *Peterborough               | 47,185     | 64,470                        |
| 31.                                     | Sault Ste. Marie            | 43,088     | 69,594                        |
| 32.                                     | *Kingston (city)            | 53,526     | 73,870                        |
| 33.                                     | *Oshawa                     | 62,415     | 76,415                        |
| 34.                                     | *St. Catharines             | 84,472     | 93,309                        |
| 35.                                     | Sudbury )                   | 110,694    | 124,279                       |
| 36.                                     | *Kitchener)                 | 154,864    | 158,018                       |
| 37.                                     | *Windsor )                  | 193,365    | 175,562                       |
| 38.                                     | *London ) Metropolitan Area | 181,283    | 243,099                       |
| 39.                                     | *Hamilton )                 | 395,189    | 393,428                       |
| 40.                                     | *Ottawa )                   | 429,750    | 437,727                       |
| 41.                                     | *Toronto )                  | 1,824,481  | 2,114,931                     |

For Comparison:

|          |           |
|----------|-----------|
| Buffalo  | 1,675,000 |
| Montreal | 2,028,557 |
| Detroit  | 5,393,000 |

\* Cities selected as centres of Development Regions in southern Ontario.



middle order centres. Despite their considerable retail sales volume, Guelph, with \$47 million, and Galt, with \$30 million, were considered to be located too close to the major centre of Kitchener to qualify as centres of separate development regions. The same reasoning applies to the cities of Welland (\$39 million) and Niagara Falls (\$40 million) which are closely located to the major city, St. Catharines.

The nineteen cities which were considered as qualifying as centres of potential development regions are shown on the map by their name while those which do not qualify are not named. The graph (Exhibit 7) shows all cities of Ontario of over 10,000 people (except Toronto) in a matrix of population and total retail sales. The graph reveals significant differences in functional performance between Windsor and London - both with about the same population for their census metropolitan areas - but with remarkable differences in total retail sales: \$176 million versus \$243 million. Consequently, the per capita retail sales for Windsor is \$908 and \$1,341 for London.

Based on this graph and on the knowledge obtained later about the service areas of these cities, the following classification for the urban centres of southern Ontario was adopted:

|                       | <u>Retail Sales</u><br><u>in million \$</u> | <u>Number of</u><br><u>Cities</u> |
|-----------------------|---|-----------------------------------|
| Highest Order Centres | Above 1,000                                 | 1                                 |
| High Order Centres    | 100 - 500                                   | 4                                 |
| Upper high            | 300 - 500                                   | 2                                 |
| Middle high           | 200 - 300                                   | 1                                 |
| Lower high            | 100 - 200                                   | 1                                 |
| Middle Order Centres  | Below 100                                   | 14                                |
| Upper middle          | 60 - 100                                    | 7                                 |
| Middle middle         | 40 - 60                                     | 5                                 |
| Lower middle          | 20 - 40                                     | 2                                 |





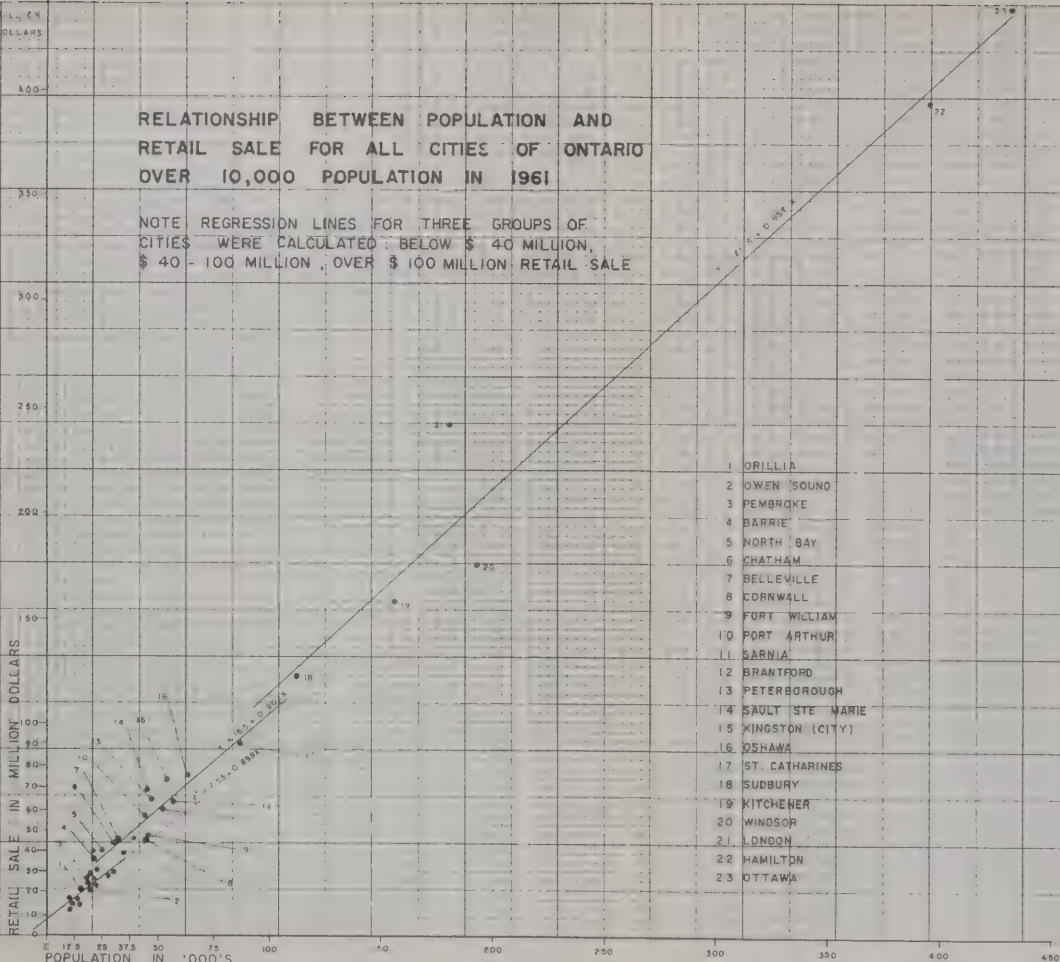
# RELATIONSHIP BETWEEN POPULATION AND RETAIL SALE FOR ALL CITIES OF ONTARIO OVER 10,000 POPULATION IN 1961

NOTE: REGRESSION LINES FOR THREE GROUPS OF  
CITIES WERE CALCULATED: BELOW \$ 40 MILLION,  
\$ 40 - 100 MILLION, OVER \$ 100 MILLION RETAIL SALE

RETAIL SALE IN MILLION DOLLARS

POPULATION IN '000'S

- 1 ORILLIA
- 2 OWEN SOUND
- 3 PEMBROKE
- 4 BARRIE
- 5 NORTH BAY
- 6 CHATHAM
- 7 BELLEVILLE
- 8 CORNWALL
- 9 FORT WILLIAM
- 10 PORT ARTHUR
- 11 SARNIA
- 12 BRANTFORD
- 13 PETERSBOROUGH
- 14 SAULT STE MARIE
- 15 KINGSTON (CITY)
- 16 OSHAWA
- 17 ST. CATHARINES
- 18 SUDBURY
- 19 KITCHENER
- 20 WINDSOR
- 21 LONDON
- 22 HAMILTON
- 23 OTTAWA





A centre is classified according to the highest level of functions and it is understood that it contains all functions of lower orders. This statement is illustrated in Exhibit 8, showing the nested arrangement of a triple hierarchy of central places in a theoretical model of an isolated metropolitan region.

In the category of highest order centres only Toronto qualifies with total retail sales of \$2,114 million and a per capita value of \$1,159; outside of Ontario, Montreal (\$2,028 million), Buffalo (\$1,675 million) and Detroit (\$5,393 million) exercise a certain influence on the neighbouring Ontario population.

The category of high order centres comprises four centres: Ottawa, Hamilton, London and Windsor.

|                             | <u>City Municipality</u> |                            |                              | <u>Census Metropolitan Area</u> |                            |                              |
|-----------------------------|--------------------------|----------------------------|------------------------------|---------------------------------|----------------------------|------------------------------|
|                             | Pop.<br>in<br>000        | Retail<br>sale<br>mill. \$ | Retail<br>sale per<br>capita | Pop.<br>in<br>000               | Retail<br>sale<br>mill. \$ | Retail<br>sale per<br>capita |
| Toronto<br>(for comparison) | 672                      | 1,147                      | 1,707                        | 1,824                           | 2,115                      | 1,159                        |
| Ottawa                      | 268                      | 342                        | 1,276                        | 430                             | 438                        | 1,019                        |
| Hamilton                    | 273                      | 313                        | 1,147                        | 395                             | 393                        | 995                          |
| London                      | 170                      | 238                        | 1,400                        | 181                             | 243                        | 1,342                        |
| Windsor                     | 114                      | 125                        | 1,096                        | 193                             | 176                        | 912                          |
| Kitchener                   | 74                       | 97                         | 1,311                        | 155                             | 158                        | 1,020                        |
| Sudbury<br>(for comparison) | 80                       | 112                        | 1,400                        | 111                             | 124                        | 1,117                        |

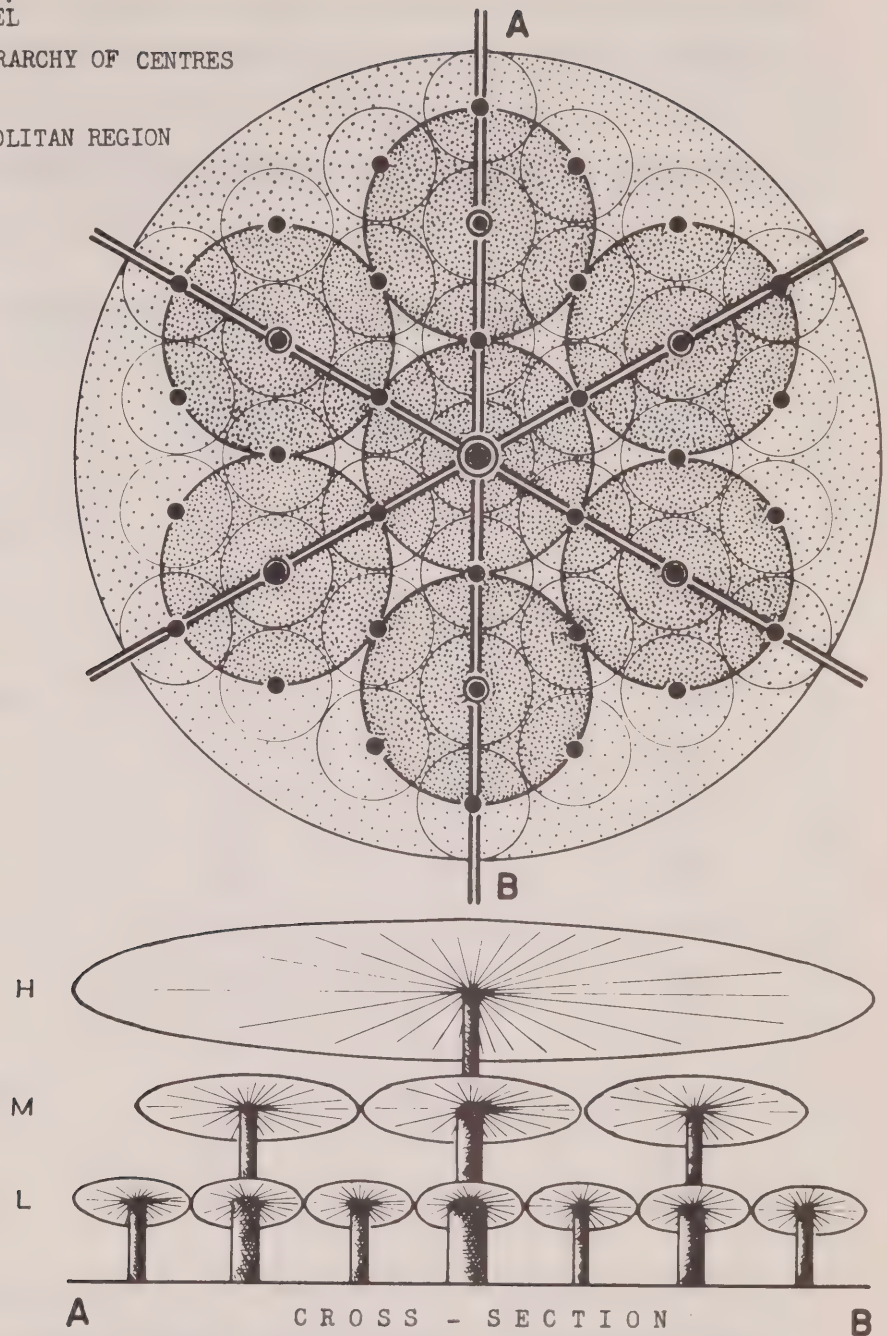
Windsor qualifies as a lower high order centre with its retail sales of \$125 million for the city and \$158 million for the metropolitan area.

The city of Kitchener, on the other hand, falls slightly short of the





THEORETICAL MODEL  
OF A TRIPLE HIERARCHY OF CENTRES  
IN AN  
ISOLATED METROPOLITAN REGION



● L : CENTRAL PLACES OF LOW ORDER

◎ M : CENTRAL PLACES OF MIDDLE ORDER

⊙ H : CENTRAL PLACES OF HIGH ORDER



\$100 million mark. Only by counting the large urbanized area surrounding Kitchener (the census metropolitan area) including among others the independent city of Galt (\$30 million) does Kitchener come close to Windsor. Therefore, Kitchener, like St. Catharines, is considered a highly developed centre of middle order.

The category of middle order centres includes 14 cities as listed in the following table.

|                | <u>Population<br/>(in 000)</u> | <u>Total Retail Sale<br/>(in million \$)</u> | <u>Per Capita<br/>Sales</u> |
|----------------|--------------------------------|--|-----------------------------|
| Kitchener      | 74                             | 97   | 1,311                       |
| St. Catharines | 84                             | 93   | 1,107                       |
| Oshawa         | 62                             | 76   | 1,225                       |
| Kingston       | 54                             | 74   | 1,370                       |
| Peterborough   | 47                             | 64   | 1,361                       |
| Brantford      | 55                             | 63   | 1,145                       |
| Sarnia         | 51                             | 60   | 1,176                       |
| Belleville     | 31                             | 45   | 1,452                       |
| Cornwall       | 44                             | 45   | 1,023                       |
| Chatham        | 30                             | 43   | 1,433                       |
| North Bay      | 24                             | 40   | 1,666                       |
| Barrie-Orillia | 21-15                          | 38-21  | 1,809-1,400                 |
| Pembroke       | 17                             | 24   | 1,411                       |
| Owen Sound     | 17                             | 22   | 1,294                       |

Thus, a preliminary answer to the question of the "geographic identification of regional growth centres" may now be given. In southern Ontario 19 centres appear to qualify of which one can be classified as highest order centre, four as high order centres and 14 as middle order centres.



The proof of the hypothesis that these cities do function on the levels mentioned is attempted in the following part of the report.





#### IV IDENTIFICATION OF TRIBUTARY AREAS

This section of the report deals with the methods used and results obtained in the identification of service areas of the cities which were previously selected. The city and its hinterland are interrelated through a variety of functional activities: (a) the journey to work, (b) mass media (news-papers, radio, television), (c) governmental services, and (d) professional and medical services, shopping and recreation. Of these four groups, the last one was the one to which specific attention was directed. The use of such central functions usually involves personal contacts, trips to and from the city, as previously shown in some detail for the case study of the Oshawa-Kingston area. In contrast to the impersonal distribution of mass media, shopping and professional services are the kind of central functions which involve personal contacts between the city and its hinterland. In addition, they create human contacts, socio-economic ties, and possibly a community of interest. The existence of such a community of interest is a pre-condition to stimulating of common action to such problems as economic development and region-wide planning.

To identify the geographical area of the elusive "city-organism", the method of personal interviews enquiring about numbers of trips, as was used in the Oshawa-Kingston case study, would certainly give good results. Similarly, personal telephone interviews, a method used for establishing the "desire-line pattern" focusing on a city, as used by the Ontario Department of Highways, would also give reliable results. Within the framework of this pilot study, however, the less expensive and faster questionnaire method was used, as described in greater detail in Appendix IV.



Questionnaires were sent to mayors, reeves, town clerks and industrial spokesmen of all communities listed in the Industrial Survey of the Trade and Industry Branch, Department of Economics and Development. The questionnaires (Exhibits 9, 10) were addressed to people who supposedly know their community well enough to feel competent to estimate the trip behaviour of the community as a whole - rather than an extrapolation of their personal trips. These people were asked to identify, on the given list of cities, those which were regularly frequented by the community's population. Furthermore, they were asked to estimate the proportion of total trips directed to each one of the cities frequented. The unavoidably subjective nature of this questionnaire survey was lessened by averaging - where available - the estimates of two or three representative spokesmen of each community.

A total of 349 questionnaires from 191 communities was received. The 191 responding communities represent 90 per cent of all 213 communities which were covered by the questionnaire survey. As the map shows, the villages, towns and cities appear fairly evenly distributed throughout the populated lands of southern Ontario. While it appears unlikely that a more involved and costly survey would alter drastically the pattern gained through this pilot survey, it would nevertheless be highly desirable to base the boundaries of the tributary areas upon a much larger and more reliable sample.

#### Delimiting the Tributary Areas of Middle and High Order

These average values were then transformed in terms of trips to centres of middle, high and highest order, as explained in some detail in Appendix IV. The crude questionnaire information was then calculated in percentage



Department of Geography,  
York University,  
2275 Bayview Avenue,  
Toronto 12, Ontario.

May 24, 1966.

The Mayor, Reeve, Clerk and Industrial Spokesman  
of Municipalities in Southern Ontario.

Dear Sirs:

The Department of Geography, York University, is conducting a study of the functional relationship between major cities in Southern Ontario and their hinterlands, or service areas. Such a study is of great importance for the understanding of socio-economic patterns in Southern Ontario.

This study of service areas is based on the criterion of personal trips by the people of your community to the major cities, as listed in the attached questionnaire. There is no better way to accumulate this information than by questionnaire. The study depends on your co-operation, and your participation will be greatly appreciated. We should like to receive two or three independent answer sheets from your community, preferably filled out by the mayor, reeve, clerk and/or industrial spokesman.

Moreover, in order to process and map the data in the allocated time, we would appreciate the return of the completed questionnaire at your earliest convenience, preferably not later than June 2, 1966.

Sincerely yours,

Hans Carol, Professor,  
Chairman,  
Department of Geography.





## Questionnaire

(Please return by June 2, 1966)

Service Area of Cities

Department of Geography

York University, Toronto 12, Ont.

Name of Community: NapaneePosition of Interviewee: Secretary - Industrial  
Commission

It is realized that people visit local towns more often than any of the larger cities listed below but this inquiry is only concerned with existing connections between your community and any of these major cities.

- 1) To which of the cities below do the people of your community regularly make personal trips for shopping, recreation or medical reasons, etc.?

(We are primarily, but not exclusively, interested in the relation of your community with the underlined cities. Please do not consider any exceptional personal connections, rather evaluate the community as a whole.)

Please indicate the appropriate cities with an X in column 1.

- 2) Of all trips to the cities which you marked with X, what proportion would you estimate to be directed to each one of the cities?

Please indicate in column 2 your rough estimate in percentages.

(e.g. 75, 20, 5 = 100%)

|                 | <u>Column 1</u><br>Our connections<br>are with | <u>Column 2</u><br>Proportion<br>of trips |
|-----------------|--|---|
| Barrie          |  |   |
| Belleville      | X  | 15%                                       |
| Brantford       |  |   |
| Brockville      |  |   |
| Chatham         |  |   |
| Cornwall        |  |   |
| Hamilton        |  |   |
| <u>Kingston</u> | X  | 60%                                       |
| Kitchener       |  |   |
| London          |  |   |
| Oshawa          |  |   |
| <u>Ottawa</u>   | X  | 2%  |
| Owen Sound      |  |   |
| Pembroke        |  |   |
| Peterborough    |  |   |
| Sarnia          |  |   |
| St. Catharines  |  |   |
| <u>Toronto</u>  | X  | 23%                                       |
| Windsor         |  |   |
|                 |  | (TOTAL 100%)                              |



Department of Geography,  
York University,  
2275 Bayview Avenue,  
Toronto 12, Ontario.

June 20, 1966

The Mayor, Reeve, Clerk and Industrial Spokesman  
of Municipalities in Southern Ontario.

Gentlemen,

Some of you received and were kind enough to reply to our questionnaire of May 24, 1966. The results obtained allowed us to compile a very interesting and, I trust, useful map. Until we received your answers to our previous letter we had not realized that we should have extended the area of inquiry further north in order to include North Bay and Sudbury as centres and also that we should have included Orillia in the list of cities.

For this reason, we should like to recast our net over the area from Barrie to North Bay. I do hope you will forgive the inconvenience of being asked to complete a similar questionnaire for the second time.

You may recall that the purpose of this study is to determine the functional relationships of cities in southern Ontario with their hinterlands or service areas - and to plot this information on a map which reveals a pattern hitherto not known.

This study of service areas is based on the criterion of personal trips by the people of your community to some of the cities which are listed in the attached questionnaire. The study depends on your co-operation, and your participation will be greatly appreciated. We should like to receive two or three independent answer sheets from your community, preferably filled out by the mayor, reeve, clerk and/or industrial spokesman.

Moreover, in order to process and map the data in the allocated time, we would appreciate the return of the completed questionnaire at your earliest convenience, preferably not later than July 5, 1966.

Sincerely yours,

HANS CAROL, Professor,  
Chairman,  
Department of Geography.



## Questionnaire

(Please return before July 5, 1966)

Service Area of Cities

Department of Geography

York University, Toronto 12, Ont.

Name of Community: PenetanguishenePosition of Interviewee: Clerk  
Treasurer

It is realized that in certain communities people visit local towns and villages more often than any of the cities listed below, but this inquiry is only concerned with existing connections between your community and any of these cities.

- 1) To which of the cities below do the people of your community regularly make personal trips for shopping, recreation or medical reasons, etc.? Please indicate the appropriate cities with an X in column 1. (Please do not consider any exceptional personal connections, rather evaluate the community as a whole.)
- 2) Of all trips to the cities which you marked with X, what proportion would you estimate to be directed to each one of the cities? Please indicate in column 2 your rough estimate in percentages (e.g. North Bay 25%, Orillia 35%, Toronto 40%).

| City  | Column 1<br>Our connections<br>are with | Column 2<br>Proportion<br>of trips |
|---|---|------------------------------------|
| Barrie  | X                                       | 15                                 |
| Orillia   | X                                       | 5                                  |
| North Bay   |   |                                    |
| Sudbury   |   |                                    |
| Toronto   | X                                       | 80                                 |
| Pembroke  |   |                                    |
| Ottawa  |   |                                    |
| Peterborough                                      |   |                                    |
| Other Cities<br>(excluding villages<br>and towns) |   |                                    |
|   |   | (TOTAL 100%)                       |

P.S. The above questionnaire can, of course, only be answered by someone fairly familiar with the community. If this does not apply to you and you therefore feel unable to answer the questions, please indicate here with an X. \_\_\_\_\_





values as indicated on the two analytical maps for the delimitation of "middle order regions" (Exhibit 11) and for the delimitation of "high order regions" (Exhibit 12).

To give an example: on the map of middle order (Exhibit 11), Napanee is indicated with 82 per cent of the trips directed to Kingston and 18 per cent to Belleville; therefore it clearly falls within the core area of Kingston (defined as an area to which over 75 per cent of the trips to middle order centres are directed.) On the high order map (Exhibit 12), Napanee appears to be related 96 per cent to Toronto and 4 per cent to Ottawa, the two competing high order centres. These figures compare very closely with the values gained through an entirely different method, namely personal interviews in the Oshawa-Kingston case study. Trips for Napanee were, on the average, declared to be directed 83 per cent to Kingston and 17 per cent to Belleville, while on the high order level 95 per cent of the trips were reported to be directed to Toronto and 5 per cent to Ottawa. This high degree of correlation between the two surveys is rather exceptional, though the two surveys do suggest a great similarity of the pattern of tributary areas.

The reliability of the data of individual questionnaires was checked in the frame of all neighbouring data. Usually the trip value decreased gradually from one centre to the 50 per cent line and increased to the neighbouring centre in a predictable manner, comparable to the results obtained from the detailed case study of the Oshawa-Kingston area. Data on several municipalities which did not fall into the general pattern were excluded in the process of delimiting the boundaries of the service areas, as indicated in Appendix IV. An example of this type is Brussels



where the data obtained from questionnaires showed 78 per cent of the trips to Kitchener and 22 per cent to London while the municipality is located in a general zone of 50-75 per cent in favour of London.

For the Oshawa-Kingston area, the delimitation of the various tributary areas follows the findings of the more accurate case study rather than the cruder questionnaire survey, except for the analytical data map (Exhibit 11).

In the case of tributary areas of high order centres the transition zones between the core areas of over 75 per cent are predictably much broader than for the middle order cores. The rule of the greater attraction of the stronger centre and consequently the creation of an enlarged service area is reflected on the map. It comes, nevertheless, as something of a surprise to find Toronto's high order service area extended so strongly against its rivals of the same order: Ottawa, Hamilton and London. Also, in the northern part of the study area, Sudbury was never mentioned as dominating over Toronto or Ottawa. The 75 per cent core area of Toronto's high order is shown as including Kingston and even Gananoque while the 50 per cent value is reached in Brockville, only 72 miles from Ottawa but 207 miles from Toronto. The unexpectedly high per cent values for Toronto have to do with the fact that Toronto's figures include trips not only to a high order centre but also a centre of highest order functions; this in contrast to Ottawa, which functions as a high order centre exclusively.

Windsor's area of predominance over London's is restricted to the narrow peninsula west from Chatham with a population of only 292,000.

On the highest level Toronto dominates not only all of southern Ontario but also the entire province and reaches for certain functions beyond



Ontario's boundary.

It should be repeated that a high degree of accuracy cannot be expected from this pilot study. Over long stretches of thinly populated areas in the north, boundaries had to be interpolated from a very scanty set of crude questionnaire data. Nevertheless, the pattern obtained does not violate the expected pattern of experienced researchers in this field of geographic study. To put it simply: on the whole, the pattern "makes sense"; it is verified to a surprising degree by the traffic pattern, as shown in the next part of this report.

#### Comparison of Centres and Tributary Areas with Pattern of Traffic Flow

The city and its tributary area together form the "functional" region <sup>this entity</sup> and/is brought to life by introducing the transportation element which relates the city to its hinterland. The "minor" traffic pattern map relates to middle order functional regions as seen in Exhibit 13, while the "major" traffic pattern map relates to high order functional regions (Exhibit 14). The Ontario Department of Highways provides basic statistics of "Annual Average Daily Traffic" (AADT) for the major highways. When interpreting these flow maps it must be borne in mind that the total is composed of such diverse constituents as (1) long distance traffic, (2) tourist traffic, (3) commuter traffic, and (4) "central place" traffic. "Central place" traffic includes personal trips for shopping, professional services, urban recreation, and so on. Since it is not feasible, (although conceptually desirable), to separate the various categories of traffic, the "regional" component - comprising central place and commuter traffic, rather than long distance and tourist traffic - should be kept in mind when comparing traffic flow patterns with urban tributary areas.





On the map of middle order regions (Exhibit 13) traffic data (AADT) are shown in a series of fine gradations ranging from below 250 vehicles per day to over 5,000 vehicles per day. Freeways (401, Q.E. and 400 to Barrie) which carry the bulk of long distance traffic are excluded. The map reveals a number of striking relationships between the traffic flow pattern and the functional regions of middle order.

Firstly, the relationship between the selected 19 cities (which serve at least as middle order centres) and the traffic nodes is obvious: the number of roads which lead to city centres and the increase in traffic volume underlines the essentially nodal character of the selected cities. Only in the case of Guelph was a major traffic node not included in the group of middle order centres. Brockville (with its important manufacturing industry) also shows considerable nodality comparable with other centres of middle order.

Secondly, the pattern of urban tributary areas is, in many instances, strikingly supported by the traffic pattern. The lowest traffic volumes between two cities frequently occur in the transitional zone between two functional core areas.

A few examples will suffice: the thin traffic bands connecting the Toronto region with the regions of Oshawa, Barrie, Kitchener-Guelph and Hamilton; the low traffic volumes between London and Sarnia, Ottawa and Cornwall, Belleville and Kingston. In the latter case, the flow on highway #2 diminishes from Belleville (3,400 AADT) to a minimum of 1,700 and even 1,200 near Deseronto, 7 miles west of Napanee, and increases again to 6,400 at Kingston. The stretch of minimal traffic flow coincides with the 50 per cent dividing line between the tributary areas



of Belleville and Kingston. In this particular case, inter-city traffic between Belleville and Kingston is carried by highway 401. Similar observations can be made from the map showing the relationship of traffic patterns to high order centres. There is a positive correlation between the five high order centres selected and the traffic nodes. The metropolitan centres appear as the hub of radiating spokes and no major traffic node occurs that does not have a high order centre as its core. Kitchener appears much weaker than London. Toronto's unique position as Ontario's highest order centre - the hub of all major roads in southern Ontario - comes clearly to light. These, and other relationships, are more fully described in Appendix V.

The close relationship between the cities and their service areas, as evidenced by traffic patterns, establishes the reality of the delimited tributary areas and shows the cities and tributary areas as interlocking and truly functional regions.



## V THE FUNCTIONAL REGIONS

The functional region represents the unity composed of node and tributary area. The map, "Functional Regions of High and Middle Order" (Exhibit 15) shows the essential pattern for southern Ontario.

In the framework of this study, the only quantitative criterion used to measure the entity of the functional region is population. The population of these regions was calculated on the basis of the map, "Functional Regions of Middle Order and Population Distribution" (Exhibit 16), as well as with census population statistics for towns and cities (Appendix IV).

For Toronto, the functional region of highest order comprises at least the whole province, although Montreal, Detroit and Buffalo are competitors for highest order central functions in the respective border areas of Ontario. The highest order functional region of Toronto can be approximated with the population of Ontario, 6,236,092 in 1961.

Southern Ontario is basically composed of five high order regions: Toronto, Ottawa, Hamilton, London and Windsor. If the total population of each functional region is considered rather than the census metropolitan areas alone, the ranking shifts considerably. The London region, with 581,000 people, moves to a similar level as Hamilton and Ottawa, while Windsor, with 292,000 people, trails far behind (Table II).

The number of middle order regions which are served by one of the high order centres seems to be a good indicator of functional dominance of the high order centres. Toronto's high order region comprises a system of nine middle order regions: Toronto, Oshawa, Peterborough, Belleville, Kingston, Barrie/Orillia, Kitchener, Owen Sound and North Bay with a





TABLE II

FUNCTIONAL REGIONS OF HIGH AND MIDDLE ORDER

| Functional<br>Regions | Population in 000's |                   | Functional<br>Unit | Per Cent |
|-----------------------|---------------------|-------------------|--------------------|----------|
|                       | Centre              | Tributary<br>Area |                    |          |
|                       | 1                   | 2                 | 3                  | 4        |
| <u>TORONTO</u>        | 1,824               | 1,242             | 3,066              | 40.5     |
| Toronto (M)           | 1,824               | 156               | 1,980              | 7.8      |
| Kitchener (M)         | 155                 | 154               | 309                | 49.8     |
| Owen Sound (C)        | 17                  | 66                | 83                 | 79.5     |
| Barrrie/Orillia (C)   | 36                  | 126               | 162                | 77.7     |
| North Bay (C)         | 24                  | 27                | 51                 | 52.9     |
| Peterborough (C)      | 47                  | 99                | 146                | 67.7     |
| Oshawa (C)            | 62                  | 65                | 127                | 51.1     |
| Belleville (C)        | 31                  | 90                | 121                | 74.3     |
| Kingston (C)          | 54                  | 107               | 161                | 66.4     |
| <u>LONDON</u>         | 181                 | 333               | 581                | 57.2     |
| London (M)            | 181                 | 262               | 443                | 59.1     |
| Chatham (C)-P         | 15                  | 39                | 54                 |          |
| Sarnia (C)            | 51                  | 33                | 84                 | 39.2     |
| <u>HAMILTON</u>       | 395                 | 398               | 793                | 50.1     |
| Hamilton (M)          | 395                 | 58                | 453                | 12.8     |
| Brantford (C)         | 55                  | 36                | 91                 | 39.5     |
| St. Catharines (C)    | 84                  | 161               | 245                | 65.7     |
| <u>OTTAWA</u>         | 333                 | 301               | 634                | 47.7     |
| Ottawa (M)            | 333                 | 142               | 475                | 29.8     |
| Pembroke (C)          | 17                  | 34                | 51                 | 66.6     |
| Cornwall (C)          | 44                  | 58                | 102                | 56.8     |
| <u>WINDSOR</u>        | 193                 | 84                | 292                | 28.7     |
| Windsor               | 193                 | 62                | 255                | 24.3     |
| Chatham - P           | 15                  | 22                | 37                 |          |

- 1) Population of city (C) or census metropolitan area (M).
- 2) 50 per cent tributary area (excluding centre).
- 3) Total of columns 1 and 2.
- 4) Population of tributary area (outside of metropolises and cities) in per cent of population of total functional region.

P = Part of region.



total population of 3.06 million. Kitchener fills the gap between the high order regions of Toronto and London. Hamilton's high order region is composed of three middle order regions: Hamilton, St. Catharines and Brantford with a total population of close to 800,000. Similarly, Ottawa's high order region is composed of three middle order regions: Ottawa, Cornwall and Pembroke with a total population of 634,000. The London high order functional region comprises 581,000 people of which 443,000 live in London's own middle order region. In addition, the middle order region of Sarnia and part of the Chatham region fall within London's orbit. The high order region of Windsor comprises only its own middle order region and the western part of the Chatham region. With a total population of 292,000 this "high order region" cannot be considered adequate for the establishment of a high order Development region; therefore, as indicated in the next section, Windsor is incorporated in the London Development region.

Within the tributary area, the distance from <sup>rural</sup> settlements to the regional centre is of considerably importance in establishing actual trip frequencies, as the findings for the Peterborough and Belleville case studies showed. Table III shows, for each centre of the 19 middle order functional regions, the maximal, minimal and average distance of the core area (75 per cent of trips) measured in direct lines, rather than in actual road mileage. The average distance for all the 19 functional regions was 26.7 miles; the average maximal distance was 38.4 and the average minimal distance 15.6. Under normal road conditions these figures suggest that the great majority of southern Ontario's population will travel a distance of less than 40 miles, i.e. less than one hour by car, to reach their major urban centre. This average limit is, however,



TABLE IIIACCESS TO CENTRES OF MIDDLE ORDER REGIONS IN MILES (DIRECT LINE)

| <u>Middle Order<br/>Functional<br/>Regions</u> | <u>Maximum Distance<br/>From Core<br/>To City</u> | <u>Minimum Distance<br/>From Core<br/>To City</u> | <u>Average Distance<br/>From Core<br/>To City</u> |
|--|---|---|---|
| London   | 74  | 20  | 47  |
| Owen Sound                                     | 60  | 25  | 42.5  |
| Peterborough                                   | 60  | 18  | 39  |
| Ottawa   | 56  | 21  | 38.5  |
| North Bay                                      | 55  | 42  | 43.5  |
| Toronto  | 47  | 21  | 34  |
| Kingston                                       | 43  | 23  | 33  |
| Pembroke                                       | 37  | 19  | 28  |
| Belleville                                     | 36  | 14  | 25  |
| Barrie & Orillia                               | 35  | 7   | 21  |
| Kitchener                                      | 35  | 9   | 22  |
| Cornwall                                       | 33  | 19  | 26  |
| Hamilton                                       | 30  | 8   | 19  |
| Oshawa   | 25  | 2   | 13.5  |
| Saint Catharines                               | 25  | 4   | 14.5  |
| Chatham  | 25  | 11  | 18  |
| Windsor  | 24  | 12  | 18  |
| Sarnia   | 19  | 16  | 17.5  |
| Brantford                                      | 10  | 5   | 7.5   |
| Averages                                       | 38.4  | 15.6  | 26.7  |





far surpassed in a few cases: London (74 miles), Owen Sound and Peterborough (60 miles), North Bay and Ottawa (56 miles) (Exhibit 16). If the 50 per cent boundary were to be taken into account, the distances would, of course, increase again somewhat.

The actual distances are even longer along the most practical road connections. For example, the people from Lucknow, on the northern border of London's core area, must travel 81 miles to London. In this area where the extremities of the tributary zones of London, Kitchener and Owen Sound converge, a number of small towns such as Walkerton (pop. 3,851), Hanover (pop. 4,401), and Durham (pop. 2,180), have to a degree developed in response to the demand for central functions in an area so remote from major centres. If there were any one place in southern Ontario where a regional centre of middle order might be deliberately planned and developed, it would probably fall in this underserved area.

Tempting as it is not only to describe the functional pattern depicted on the maps, but also to explain it, such an explanation would require a detailed study of the various forces, central and administrative functions, traffic, manufacturing and conscious economic development by individuals and collectivities, which have been responsible during the last century and a half for the growth of these cities and regions. Such an endeavour, however, is clearly beyond the scope of the present study.

Taking into account the rather uneven distribution of the population in southern Ontario, some remarkable regularities can nevertheless be observed. Among these are the 40-50 mile distances between Oshawa,



Peterborough, Belleville, Kingston, Brockville, and Cornwall and the striking regularity of spacing in the western part of Ontario. On the other hand, the city cluster of Hamilton, Brantford, Kitchener, with Galt and Guelph, is somewhat exceptional. A unique situation has apparently developed in the case of Barrie and Orillia which, judging from the questionnaires, function as a kind of twin-city service centre for an extended functional unit of middle order. Finally, Toronto appears to be optimally located to perform its highest order functions for all of southern Ontario.



## VI DELIMITING DEVELOPMENT REGIONS

This section attempts to bring the study to a number of practical conclusions. The functional pattern of cities and tributary areas, as they have evolved over a century and brought to light in the previous section, are considered as the socio-economic foundation upon which a conscious effort of improvement and further development should be based. Specifically, the underlying hypothesis of this study assumes that the functional region - defined in terms of the myriad personal inter-relationships between the city and its tributary area - should form the basic unit upon which regional development ought to be based. It is the community of interest which generates the desire for improvement of one's region and which stimulates regional initiative and drive. If development and planning is encouraged from a higher authority and at the same time is desired by the regional population, optimal results may be obtained.

This report, similar to some recent proposals for the reform of regional government, recognizes both the need for integration between the city and its hinterland as well as the advantages of considering them together in one functionally interlocked unit. This approach departs radically from the idea behind the Baldwin Act of 1849 which separated the administrative and local government functions of the urban portions of the counties from the rural.

This section of the report, stated simply, translates the variously shaped functional regions into a quasi congruent framework of precisely defined administrative regions. Ideally, one might conceive of delimiting the functional regions with an entirely new set of functional





boundaries. The advantages of such a procedure would, however, be far outweighed by the disadvantages involved in discarding the existing pattern of county and municipal boundaries. For this reason, our task is to regroup the existing pattern of counties and municipalities in such a way that they approximate the functional regions.

The results are shown on two maps: "DEVELOPMENT REGIONS OF HIGH AND MIDDLE ORDER DELIMITED BY COUNTY BOUNDARIES" (Exhibit 17) and "DEVELOPMENT REGIONS OF HIGH AND MIDDLE ORDER DELIMITED BY COUNTY AND TOWNSHIP BOUNDARIES" (Exhibit 18). The first map represents only a coarse approximation to the functional pattern; the second aims at a much finer degree of approximation to the functional regions. It must be left to the relevant Provincial authorities to weigh the various advantages and disadvantages of each of the two proposals in any programme of restructuring. Further, in this study, relationships with the Federal government as well as relationships with local authorities have not been taken into consideration.

Both maps have in common the proposition that a three-tier hierarchy of regions is the most suitable for economic development and planning:

Ontario as a whole

|  |   |                     |
|--|---|---------------------|
| Four high order development regions        | ) |                     |
| Nineteen middle order development regions. | ) | in southern Ontario |

Such a hierarchy of development regions would allow more flexibility in assigning specific problems to the appropriate level of authority. Industrial, recreational or highway developments could be planned for on the level of the Province, the high order regions, the middle order regions as well as by the local authorities.



### Development Regions by Counties

In the map of middle and high order development regions, the 47 counties of southern Ontario are regrouped in the way shown in Table IV. Only two exceptions were made to the rule that entire counties were to be regrouped in approximation to the functional regions. The three eastern municipalities of Lincoln county were allocated together with Welland county to the St. Catharines region. Secondly, in the case of Halton county, the township of Nelson with the city of Burlington was allocated to the Hamilton region, while the rest of the county remains with the Toronto region.

One could argue that Northumberland county should be tied to the Peterborough region rather than to the Belleville region. However, that portion of Peterborough's core area lying south of Rice lake is only very thinly populated while the densely populated areas of Northumberland county are more closely associated with Belleville.

In the whole, according to this regionalization, the 47 counties of southern Ontario would be grouped into 19 middle order Development regions which in turn would be aggregated to four high order Development regions.

### Development Regions by Counties and Townships

In this map (Exhibit 18) and the corresponding Table V a much finer adjustment of the Development regions has been attempted by regrouping not only of entire counties but also of townships to approximate the functional regions of middle order. However, in no case was a township entity split in order to obtain a more appropriate regional boundary.



TABLE IVDEVELOPMENT REGIONS OF HIGH AND MIDDLE ORDER BY ENTIRE COUNTIES

| <u>Development<br/>Regions</u> | <u>Counties</u>                 | <u>Population</u><br>(000's) | <u>Area</u><br>(Sq. miles) |
|--------------------------------|---------------------------------|------------------------------|----------------------------|
| <u>TORONTO</u>                 |                                 | 3,193                        | 35,581                     |
| Toronto                        |                                 | 1,931                        | 2,198                      |
|                                | Dufferin                        | 16                           |                            |
|                                | Halton <sup>(1)</sup> (part of) | .70                          |                            |
|                                | Peel                            | 112                          |                            |
|                                | York                            | 1,733                        |                            |
| Kitchener                      |                                 | 261                          | 1,535                      |
|                                | Waterloo                        | 177                          |                            |
|                                | Wellington                      | 85                           |                            |
| Owen Sound                     |                                 | 105                          | 3,356                      |
|                                | Bruce                           | 43                           |                            |
|                                | Grey                            | 62                           |                            |
| Barrie/Orillia                 |                                 | 168                          | 3,284                      |
|                                | Simcoe                          | 141                          |                            |
|                                | Muskoka                         | 27                           |                            |
| North Bay                      |                                 | 100                          | 11,896                     |
|                                | Nipissing                       | 71                           |                            |
|                                | Parry Sound                     | 29                           |                            |
| Peterborough                   |                                 | 115                          | 4,249                      |
|                                | Haliburton                      | 9                            |                            |
|                                | Victoria                        | 30                           |                            |
|                                | Peterborough                    | 76                           |                            |
| Oshawa                         |                                 | 176                          | 1,482                      |
|                                | Ontario                         | 136                          |                            |
|                                | Durham                          | 40                           |                            |
| Belleville                     |                                 | 156                          | 3,447                      |
|                                | Northumberland                  | 42                           |                            |
|                                | Hastings                        | 93                           |                            |
|                                | Prince Edward                   | 21                           |                            |
| Kingston                       |                                 | 158                          | 3,668                      |
|                                | Lennox - Addington              | 24                           |                            |
|                                | Frontenac                       | 87                           |                            |
|                                | Leeds                           | 47                           |                            |





TABLE IV - Continued

| <u>Development<br/>Regions</u>             | <u>Counties</u>     | <u>Population</u><br>(000's) | <u>Area</u><br>(Sq. miles) |
|--|---------------------|------------------------------|----------------------------|
| <u>LONDON</u>                              |                     | 915                          | 6,844                      |
| London                                     |                     | 466                          | 4,095                      |
|  | Huron               | 54                           |                            |
|  | Perth               | 57                           |                            |
|  | Middlesex           | 221                          |                            |
|  | Elgin               | 63                           |                            |
|  | Oxford              | 71                           |                            |
| Windsor                                    |                     | 258                          | 707                        |
|  | Essex               | 258                          |                            |
| Chatham                                    |                     | 89                           | 918                        |
|  | Kent                | 89                           |                            |
| Sarnia                                     |                     | 102                          | 1,124                      |
|  | Lambton             | 102                          |                            |
| <u>HAMILTON</u>                            |                     | 849                          | 2,793                      |
| Hamilton                                   |                     | 449                          | 1,240                      |
|  | Wentworth           | 359                          |                            |
|  | Haldimand (2)       | 28                           |                            |
|  | Nelson Twp. (2)     | 36                           |                            |
|  | Part of Lincoln (3) | 26                           |                            |
| Brantford                                  |                     | 134                          | 1,055                      |
|  | Brant               | 84                           |                            |
|  | Norfolk             | 50                           |                            |
| St. Catharines                             |                     | 266                          | 498                        |
|  | Welland             | 165                          |                            |
|  | Part of Lincoln (4) | 101                          |                            |
| <u>OTTAWA</u>                              |                     | 625                          | 7,269                      |
| Ottawa                                     |                     | 441                          | 2,986                      |
|  | Lanark              | 40                           |                            |
|  | Carleton            | 353                          |                            |
|  | Russell             | 21                           |                            |
|  | Prescott            | 27                           |                            |
| Pembroke                                   |                     | 90                           | 3,009                      |
|  | Renfrew             | 90                           |                            |
| Cornwall                                   |                     | 117                          | 1,739                      |
|  | Dundas              | 17                           |                            |
|  | Stormont            | 58                           |                            |
|  | Glengarry           | 19                           |                            |
|  | Grenville           | 23                           |                            |
| Southern Ontario (including Nipissing Co.) |                     | 5,582                        | 52,487                     |
| Southern Ontario (excluding Nipissing Co.) |                     | 5,482                        | 40,591                     |



TABLE IV - Continued

Footnotes:

1. Excluding Nelson Township (Burlington).
2. Including Nelson Township (Burlington) of Halton County.
3. Lincoln County: North Grimsby, South Grimsby, Caistor, Gainsborough, Clinton Townships, the town of Grimsby and the village of Beamsville.
4. Lincoln County: Louth, Niagara, Grantham Townships and the city of St. Catharines.



By adjusting to township boundaries, Kitchener's Development region was made almost completely identical with Kitchener's core area of middle order region. It contains not only the entire county of Waterloo, but also most of Wellington county and parts of Perth and Brant counties. The Toronto Development region receives a more reasonable western and northern boundary. It becomes possible to tie the northern part of Ontario county to the Barrie/Orillia Development region, rather than to the Oshawa region, some 45-65 miles away.

Similarly, the Peterborough, Belleville and Kingston Development regions can be adjusted to conform more closely to their functional pattern. Bancroft, in the north of Hastings county, predominantly tied to Peterborough region, is allocated accordingly. Some of the northern townships of Durham county, located a few miles from the city of Peterborough, are also allocated to Peterborough's middle order Development region. The middle order Development regions of Ottawa and Pembroke are adjusted to conform better to their functional regions.

In two broad areas the county boundaries correspond so well to the functional regions that they could be retained unchanged. The county boundaries are perfectly adequate to delimit the common frontier of the Ottawa and Cornwall Development regions, while in the Ontario peninsula west of London, Lambton county closely conforms to the Sarnia Development region, Kent county to the Chatham region, and Essex county to the Windsor region.

#### Some Alternative Proposals

Now that an overall picture of the functional delimitation of Development regions has been presented, some alternative solutions may also be suggested.





TABLE V

DEVELOPMENT REGIONS OF HIGH AND MIDDLE  
ORDER BY COUNTIES AND TOWNSHIPS

| Development<br>Regions | Counties and<br>Townships                              | Population | Area |
|------------------------|--|------------|------|
| <u>TORONTO</u>         |  | 3,161,547  |      |
| Toronto                |  | 1,944,904  |      |
|                        | York   | 1,733,108  |      |
|                        | Part of Wellington - Erin                              | 4,277      |      |
|                        | Peel   | 111,575    |      |
|                        | Part of Halton (except Burlington)                     | 70,615     |      |
|                        | Part of Simcoe - Adjala                                | 1,628      |      |
|                        | Tecumseh   | 3,209      |      |
|                        | W. Gwillimbury   | 2,642      |      |
|                        | Towns and Villages                                     | 6,814      |      |
|                        | Part of Dufferin - E. Luther                           | 885        |      |
|                        | Amaranth   | 1,643      |      |
|                        | Mono   | 2,138      |      |
|                        | E. Garafraxa   | 1,143      |      |
|                        | Towns and Villages                                     | 5,227      |      |
| Kitchener              |  | 302,111    |      |
|                        | Part of Perth (except section in<br>London region)     | 40,481     |      |
|                        | Waterloo   | 176,754    |      |
|                        | Part of Oxford - Blenheim                              | 4,451      |      |
|                        | Part of Wellington (except Erin)                       | 79,420     |      |
|                        | Towns and Villages                                     | 1,005      |      |
| Owen Sound             |  | 94,770     |      |
|                        | Grey   | 62,005     |      |
|                        | Part of Bruce (except section in<br>London region)     | 32,765     |      |
| Barrie/Orillia         |  | 162,153    |      |
|                        | Muskoka  | 26,705     |      |
|                        | Part of Dufferin (except section in<br>Toronto region) | 5,059      |      |
|                        | Part of Simcoe (except section in<br>Toronto region)   | 126,978    |      |
|                        | Part of Ontario - Rama                                 | 916        |      |
|                        | Mara   | 2,495      |      |
| North Bay              |  | 57,580     |      |
|                        | Parry Sound  | 29,632     |      |
|                        | Nipissing (south of the French R.)                     | 37,948     |      |
| Peterborough           |  | 131,549    |      |
|                        | Haliburton   | 8,928      |      |
|                        | Victoria   | 29,750     |      |
|                        | Peterborough   | 76,375     |      |
|                        | Part of Durham (except section in<br>Oshawa region)    | 5,170      |      |



TABLE V - Continued

| Development Regions     | Counties and Townships                                       | Population | Area |
|-------------------------|--|------------|------|
| Peterborough<br>(Cont.) | Part of Northumberland - S. Monaghan                         | 733        |      |
|                         | Part of Hastings - Wollaston                                 | 731        |      |
|                         | Limerick   | 336        |      |
|                         | Cashel   | 568        |      |
|                         | Faraday  | 1,570      |      |
|                         | Dungannon  | 1,113      |      |
|                         | Mays   | 425        |      |
|                         | Herschel   | 652        |      |
|                         | Monteagle  | 1,200      |      |
|                         | Carlow   | 420        |      |
|                         | Wicklow, Bangor and McClure                                  | 963        |      |
|                         | Towns and Villages   | 2,615      |      |
|                         |  | 167,230    |      |
| Oshawa                  | Part of Ontario (except section in<br>Barrie/Orillia region) | 132,484    |      |
|                         | Part of Durham=Cartwright                                    | 1,556      |      |
|                         | Darlington   | 9,601      |      |
|                         | Clarke   | 3,980      |      |
|                         | Hope   | 2,849      |      |
|                         | Towns and Villages   | 16,760     |      |
|                         |  | 147,566    |      |
| Belleville              | Prince Edward  | 21,108     |      |
|                         | Part of Northumberland (except S.<br>Monaghan)               | 41,159     |      |
|                         | Part of Hastings (except section in<br>Peterboro region)     | 82,784     |      |
|                         | Part of Lennox-Addington: Denbigh )                          |            |      |
|                         | Abinger )  | 701        |      |
|                         | Ashby )  |            |      |
|                         | Kaladar )  |            |      |
|                         | Anglesea )   | 1,405      |      |
|                         | Effingham)   |            |      |
|                         | Towns and Villages   |            |      |
| Kingston                | Part of Frontenac - Barrie                                   | 409        |      |
|                         |  | 153,684    |      |
|                         | Leeds  | 46,889     |      |
|                         | Part of Lennox-Addington (except<br>section in Belleville)   | 21,611     |      |
|                         | Part of Frontenac - Olden                                    | 728        |      |
|                         | Oso  | 1,141      |      |
|                         | Kennebec   | 788        |      |
|                         | Hinchinbrooke  | 1,088      |      |
|                         | Bedford  | 788        |      |
|                         | Portland   | 3,059      |      |
|                         | Loughborough   | 2,107      |      |
|                         | Storrington  | 2,104      |      |
|                         | Pittsburgh   | 9,024      |      |
|                         | Kingston   | 10,442     |      |
|                         | Howe Island  | 220        |      |
|                         | Wolfe Island   | 1,169      |      |
|                         | Towns and Villages   | 53,526     |      |



TABLE V - Continued

| Development<br>Regions | Counties and<br>Townships                            | Population | Area |
|------------------------|--|------------|------|
| <u>LONDON</u>          |  | 896,925    |      |
| London                 |  | 447,149    |      |
|                        | Huron  | 53,805     |      |
|                        | Middlesex  | 221,422    |      |
|                        | Elgin  | 62,862     |      |
|                        | Part of Perth - Logan                                | 2,262      |      |
|                        | Ellice   | 2,704      |      |
|                        | North Easthope                                       | 2,116      |      |
|                        | South Easthope                                       | 1,646      |      |
|                        | Hibbert  | 1,636      |      |
|                        | Fullarton  | 1,555      |      |
|                        | Downie   | 2,595      |      |
|                        | Blanshard  | 1,991      |      |
|                        | Towns and Villages                                   | 27,866     |      |
|                        | Part of Oxford (except Blenheim)                     | 66,048     |      |
|                        | Part of Norfolk - Middleton                          | 3,917      |      |
|                        | North Walsingham                                     | 2,920      |      |
|                        | South Walsingham                                     | 2,431      |      |
|                        | Houghton   | 2,276      |      |
|                        | Towns and Villages                                   | 4,214      |      |
|                        | Part of Bruce - Huron                                | 1,449      |      |
|                        | Kinloss  | 1,258      |      |
|                        | Culross  | 1,769      |      |
|                        | Carrick  | 2,534      |      |
|                        | Towns and Villages                                   | 3,261      |      |
| Windsor                | Essex  | 258,218    |      |
| Chatham                | Kent   | 89,427     |      |
| Sarnia                 | Lambton  | 102,131    |      |
| <u>HAMILTON</u>        |  | 824,347    |      |
| Hamilton               |  | 449,174    |      |
|                        | Wentworth  | 358,837    |      |
|                        | Haldimand  | 28,197     |      |
|                        | Burlington   | 36,352     |      |
|                        | Part of Lincoln - North Grimsby                      | 5,757      |      |
|                        | South Grimsby  | 2,319      |      |
|                        | Caistor  | 1,670      |      |
|                        | Gainsborough   | 2,532      |      |
|                        | Clinton  | 5,825      |      |
|                        | Towns and Villages                                   | 7,685      |      |
| Brantford              |  | 118,546    |      |
|                        | Brant  | 83,839     |      |
|                        | Part of Norfolk (except section in<br>London region) | 34,707     |      |
| St. Catharines         |  | 265,627    |      |
|                        | Welland  | 164,741    |      |
|                        | Part of Lincoln - Louth                              | 5,086      |      |
|                        | Niagara  | 8,616      |      |
|                        | St. Catharines                                       | 84,472     |      |
|                        | Towns and Villages                                   | 2,712      |      |



TABLE V - Continued

| Development<br>Regions | Counties and<br>Townships                    | Population | Area |
|------------------------|--|------------|------|
| <u>OTTAWA</u>          |  | 648,939    |      |
| Ottawa                 |  | 467,668    |      |
|                        | Prescott                                     | 27,226     |      |
|                        | Russell                                      | 20,892     |      |
|                        | Carleton                                     | 352,932    |      |
|                        | Lanark                                       | 40,313     |      |
|                        | Part of Frontenac - N. Canonto )             |            |      |
|                        | S. Canonto )                                 | 384        |      |
|                        | Palmerston )                                 |            |      |
|                        | Clarendon )                                  |            |      |
|                        | Miller )                                     | 557        |      |
|                        | Part of Renfrew - Ross                       | 1,660      |      |
|                        | Horton                                       | 1,610      |      |
|                        | McNab  | 3,288      |      |
|                        | Admaston                                     | 1,325      |      |
|                        | Bagot )                                      |            |      |
|                        | Blythfield )                                 | 1,013      |      |
|                        | Brougham                                     | 288        |      |
|                        | Matawatchan                                  | 411        |      |
|                        | Towns and Villages                           | 15,879     |      |
| Pembroke               | Renfrew (except section in<br>Ottawa region) | 64,161     |      |
| Cornwall               |  | 117,110    |      |
|                        | Glengarry                                    | 19,217     |      |
|                        | Stormont                                     | 57,867     |      |
|                        | Dundas                                       | 17,162     |      |
|                        | Grenville                                    | 22,864     |      |





If a decrease in the number of Development regions of middle order should be desirable it is suggested (1) that the Oshawa region might be incorporated in the middle order Toronto region. Increasingly, parts of Ontario county are already becoming influenced not only by Oshawa but also by Toronto in respect to commuting and to recreational land use. (2) Brantford's functional region (91,000 people) as well as its Development region (119,000 people) is relatively small in terms of population; furthermore, its southern part is only slightly oriented toward Brantford. The whole region might therefore be added to Hamilton's middle order Development region. (3) A difficult problem is posed with the twin centres of Barrie and Orillia. Orillia is the closest city to the important tourist area to the north and, as such, has certain locational advantages. Barrie, as the most conveniently located city for the southern part of the region, has important locational advantages owing to its close connections with Toronto. From this viewpoint it might be less difficult to develop Barrie rather than Orillia. Barrie might also be best suited as the seat of the Development organization. (4) Owing to the relatively small population of their constituent centres, the Development regions of Owen Sound (95,000 people), North Bay (100,000 people) (including both entire counties Nipissing and Parry Sound), and Pembroke (64,000 people), not counting the tributary area in Quebec territory, may prove to raise some difficult problems. It should be borne in mind, however, that in the near future these regions will probably experience a much stronger recreational and other resource-based development which will stimulate also the growth of their major centres. These three regions together have an existing population of a quarter of a million and it might not be desirable to tolerate distances of over 100 miles from the centre to the outposts of the region.



On the other hand, if an increase in the number of Development regions and a reduction in their size should be deemed more desirable, the following changes might seem warranted: (1) Brockville, a respectable centre generating \$28 million in retail sales and with some major industries, might be a logical choice. Its Development region might include Leeds and Grenville counties with a total population of 70,000. (2) As mentioned previously, the remote northern area of London's middle order functional region may require a regional centre. Such a centre would have to be newly created and places like Goderich, Kincardine, Walkerton, or Wingham might qualify as the potential location of a new city of some tens of thousands of people. It is worthwhile to note that the population of this area is the only one in southern Ontario which is clearly deficient of a middle order centre within reasonable reach. (3) If these minor changes should not suffice, existing cities (of a lower order) and their tributary areas would have to be taken into account. Cities such as Stratford, Woodstock, St. Thomas, Lindsay, Welland, Guelph, Collingwood and Parry Sound might qualify. To do this would require a more exhaustive survey of not only the high and middle order but also of the low order centres and regions throughout the study area.

Another alternative might be the elimination of the proposed high order Development regions. The high order regions might be considered unnecessary and the Province would directly administer the 19 regions. One could imagine an ever more far-reaching alternative in which only the four high order Development regions would be retained and the 19 middle order Development regions dropped. The latter might well become the pattern of the twenty-first century, but it is highly doubtful if it would be the most reasonable solution for the coming decades.



### A Note on Northern Ontario

Finally, some consideration should be given to the huge area of northern Ontario north of North Bay. As the map (Exhibit 6) shows, there are only six cities of over 10,000 people which may serve as centres of development regions. Tentatively, it could be suggested that Sudbury (\$124 million in retail sales) and Port Arthur/Fort William combined (\$104 million) could serve as centres of high order Development regions. Rather than postulate a continuous set of regions of middle order, as in southern Ontario, several non-contiguous regions would notably emerge, such as New Liskeard, Kirkland Lake, Timmins, Kapuskasing, Kenora, and Fort Frances. The remainder of the huge northlands might be administered directly from the centres of the high order Development regions.

### A Note on Nomenclature

It might be desirable to use synonymous and more popularly appealing terms instead of the technical terms used in this report. The following list might be suggested:

|                      |                     |
|----------------------|---------------------|
| High Order centre:   | Metropolis          |
| High Order region:   | Metropolitan-region |
| Middle Order centre: | City                |
| Middle Order region: | City-region.        |

For example, one could say that the Hamilton Metropolitan-region is comprised of three City-regions: the Hamilton City-region, Brantford City-region and St. Catharines City-region. In some cases it might be preferable to name the regions with recognized descriptive terms rather than to identify them by their city or metropolis. Thus, "Niagara region" would be used instead of St. Catharines region; "Bruce region" instead of Owen Sound region; "Western Ontario region" instead of London Metropolitan-region, etc.





### A Note on Recent Local Government Reports

It is interesting to note that several studies on regional government are in the making or have been recently released. How are they related to this study of economic Development regions? The Ottawa study suggests embracing the whole of Carlton county; the Niagara study includes Lincoln and Welland counties; and the Mississagua study includes the counties of Halton and Peel. The Niagara report suggests an area comparable to the middle order Development region of St. Catharines. It includes, however, the western townships of Lincoln county, Grimsby, the townships of North Grimsby and of South Grimsby. All three local authorities fall definitely into the core area of Hamilton's functional region of middle order. The questionnaire survey for Grimsby indicated 88 per cent of the trips to Hamilton and 12 per cent to St. Catharines; the answers for South Grimsby showed 73 per cent directed to Hamilton and 27 per cent to St. Catharines.<sup>1</sup> Allocating Grimsby to the Niagara region, as suggested in the Mayo report, was one point criticized by the reeve of North Grimsby.

The studies on reorganization of local and regional government mentioned above point up the danger of a piecemeal approach in the delimitation of new forms of local and regional government. They indicate the urgency of establishing province-wide principles and guidelines for the process of adjustment of 19th century political patterns to the needs of the latter part of the 20th century. This author is inclined to believe that the city-centred Development region as outlined in this report might well serve as the basis for a comprehensive study on regional government.

2

In the study of the Province of Quebec, the delimitation of areas for regional government was based, as is this study, on the criterion of the



functional inter-relation of city and hinterland. A close approximation of the counties and parts of counties to the functional regions was sought. However, the similarity between the two studies seems to end on this common principle since the Quebec study did not recognize a hierarchy of middle and of high order functional or governmental regions.

#### A Note on Ontario's Ten Economic Regions

Southern Ontario is presently divided into eight Economic Regions, including the southern portion of the Northeastern Ontario Region (Exhibit 19). The number of Economic Regions is about half as much as the number of middle order Development regions suggested in this survey, but it is twice as much as the suggested four high order Development regions. As a comparison with the core areas of the functional regions of middle order shows, the closest similarity occurs with the Central Ontario Region (Toronto) for which the seat has not been definitely decided. Most other Economic Regions consist of two or three or even four functional regions, as is the case for the Eastern Ontario Region. In the case of the Lake Ontario Economic Region, Peterborough's and Belleville's functional regions are fully within the Economic region and its boundary also includes parts of Kingston's and Oshawa's functional regions. The Midwestern Region, with its seat in Stratford, includes the northern portion of the functional region of London and also the Kitchener region. The Georgian Bay region stretches from the Development Council's offices in Midland, 164 road miles to Lake Nipissing - a point only ten miles from North Bay, the Development Council seat of the neighbouring region.

These observations support the idea that the present Economic Regions of Ontario do not conform to functional, city-based regions. When, in 1953, the system of economic regions was formalized for Canada, the



purpose of the Economic regions was not administrative or developmental but analytical and statistical arising from an earlier set of regions for the Federal Department of Defense Production.

The philosophy behind regionalization of Canada was restated in 1964 by Camu, Weeks and Sametz.<sup>3</sup> The hypothesis was put forward that the economic regions of Canada constitute economic entities in respect to the following criteria: Structure (S) Function (F) Production (P) and Marketing (M). Scrutinizing the regions of southern Ontario, one can find little functional unity (F factor) as pointed out in the case-study on the Lake Ontario Economic Region. Neither do they represent resource-based structural unity (S factor) as the lumping together of such diverse structural units as shield land (low agricultural, but high recreational capability and economic output) and the southern lowlands (high agricultural, but low recreational capability and economic output) in the Lake Ontario Region indicates clearly enough. A maximum of ten regions were allocated to each province - a number predetermined by the requirement of computerized processing of statistical data. In the whole, the economic regions represent not much more than an arbitrary territorial grouping of 3 to 11 neighbouring counties. A decade ago, when these economic regions were adopted by the Ontario Department of Economics and Development they probably seemed to be the only available and "scientifically" delimited set of regions larger than the county.

It might be of some interest to evaluate the organizational advantages and disadvantages of the "Economic regions" with the set of "Development regions" proposed here. However, a comparative evaluation of various alternatives is beyond the scope of the present study. Such a comparison would require a thorough familiarity with the kind of functions assigned





to the Development regions, a not inconsiderable skill in comparative regional analysis and finally a political decision as to the feasibility and desirability of the alternatives in respect to Ontario's people.

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Footnotes (Delimiting Development Regions)

1. Due to an error in drafting, the boundaries of the middle order functional regions (Exhibits 11, 13, 14, 15, 16) are located too closely to St. Catharines; they probably should be drawn across Clinton township.
2. Bureau de Recherches Economique, Ministère de l'Industrie et du Commerce, Province de Québec, Les poles d'attraction et les zones d'influence, Quebec, 1965 (with maps).
3. P. Camu, E.P. Weeks, Z.W. Sametz, Economic Geography of Canada, with an introduction to a 68-Region System, McMillan, Toronto, 1964.





## VII CONCLUSIONS

1. It is the basic assumption of this pilot study that economic Development regions should approximate functional City-regions. Functional regions consist of two components - the city and the tributary area - the two being linked by various functional connections such as commuter relations, administrative relations and central functions (in the narrow sense). This study focussed on the relations of the population of the tributary area (hinterland) to the central functions of the city. This relationship was measured in terms of numbers of personal trips to the cities or in terms of the proportion of personal trips to neighbouring cities.

2. In general, functional regions occur in an hierarchical order. In Ontario, the highest order functional region is represented by the Province as a whole with Toronto as its centre. Four metropolitan centres clearly serve as centres of high order regions: Toronto, Ottawa, Hamilton, London (Windsor does not appear fully qualified). These four metropolitan centres and an additional 15 cities serve as centres of middle order regions, thus bringing the total for southern Ontario to 19 middle order regions, including North Bay.

3. It was found that the functional pattern, as it has evolved over a century to its present shape, could be brought to light in the analytical part of this study and could profitably form the basis for well-rooted and efficient organization of economic development. The proposed set of Development regions is modelled after the existing pattern of functional regions. It recognizes as basic principle the community of interest between the population of the city and its hinterland. A



triple hierarchy of administration of the Development regions is proposed: highest order Development Region (Province); high order Development Regions; middle order Development Regions.

DEVELOPMENT REGIONS DELIMITED BY COUNTY  
AND TOWNSHIP BOUNDARIES

| <u>High Order</u> | <u>Population</u><br>000's | <u>Middle Order</u> | <u>Population</u><br>000's |
|-------------------|----------------------------|---------------------|----------------------------|
| TORONTO           | 3,163                      | Toronto             | 1,945                      |
|                   |                            | Kitchener           | 302                        |
|                   |                            | Owen Sound          | 95                         |
|                   |                            | Barrie/Orillia      | 162                        |
|                   |                            | *North Bay          | 58                         |
|                   |                            | Peterborough        | 132                        |
|                   |                            | Oshawa              | 167                        |
|                   |                            | Belleville          | 148                        |
|                   |                            | Kingston            | 154                        |
| OTTAWA            | 649                        | Ottawa              | 468                        |
|                   |                            | Pembroke            | 64                         |
|                   |                            | Cornwall            | 117                        |
| HAMILTON          | 825                        | Hamilton            | 449                        |
|                   |                            | Brantford           | 119                        |
|                   |                            | St. Catharines      | 257                        |
| LONDON            | 896                        | London              | 447                        |
|                   |                            | Sarnia              | 102                        |
|                   |                            | Chatham             | 89                         |
|                   |                            | Windsor             | 258                        |

\* Only southern part of Development region included.

4. The nineteen cities and metropolises which actually serve as centres of functional regions ought to be selected as both administrative seats and major growth poles for the Development regions. In this way, the principle of "concentrated decentralization" can exert an equalizing impact on economic growth throughout the province.

5. It is assumed that the proposed hierarchy would be beneficial to assign economic development tasks to adequate territories. The



assignment can be made on the level of the province, the level of the high order Development region, the level of the middle order Development region, or on the level of the local authorities.

6. This survey gives evidence to the assumption that the present set of Economic Regions of Ontario bears little resemblance to the basic pattern of existing city-based functional regions.





## VIII RECOMMENDATIONS

1. In the process of studying this report the proposed hierarchical set of Development regions and the various alternatives should be tested by the Regional Development Branch, as to its validity as a framework for administering regional economic development.
2. If the proposed set of Development regions should be considered useful for the task of economic development, it would be desirable to validate the findings of this pilot study by more elaborate methods:
  - a) The proposed growth poles should be investigated as to the factors which brought about and maintained their existence. Similarly, they should be investigated as to their growth potential in the future.
  - b) A more elaborate survey should identify more reliably and more accurately, the tributary areas of the potential growth poles. Two aspects might have to be taken into account: the central functions (as in the pilot study) and the commuter functions.
3. Based on the findings of the foregoing, the Development regions might have to be further adjusted. The question of desirable hierarchies would have to be studied, e.g. would there be a need for a set of Development regions of a level below the middle order proposed in this study?
4. The same principles which are used for this study of southern Ontario should be applied to a study of northern Ontario. Due emphasis should be placed on the very different economic development in the past and the different potentials for the future of the two uneven parts of the Province.



5. It is recommended that the findings of this pilot study and its critical evaluation by the Regional Development Branch should be brought before the inter-departmental Cabinet Committee in order to determine:

- a) the usefulness of the Development regions as administrative framework for other Ontario Government Departments;
- b) the usefulness of the Development regions as a framework for future regional government.

6. Finally, the various research and planning activities proposed should not be seen as isolated endeavours but as converging attempts to reshape Ontario's organizational pattern to the needs of the latter part of the Twentieth century.



ERRATA:

- 1) Middle order boundaries between Hamilton and St. Catharines should be broader spaced and more closely moved toward the half-way distance between Hamilton and St. Catharines (Exhibits 11, 13, 15, 16).
- 2) Grenville County should be subtracted from Kingston/Toronto regions and added to Cornwall/Ottawa regions (Exhibit 17).



# CITIES AND METROPOLISES IN ONTARIO

CIRCLES REPRESENT ALL CITIES OR METROPOLISES OVER 10,000  
POPULATION IN 1961. THE CIRCLES ARE PROPORTIONATE TO THE  
TOTAL RETAIL SALE IN 1961.

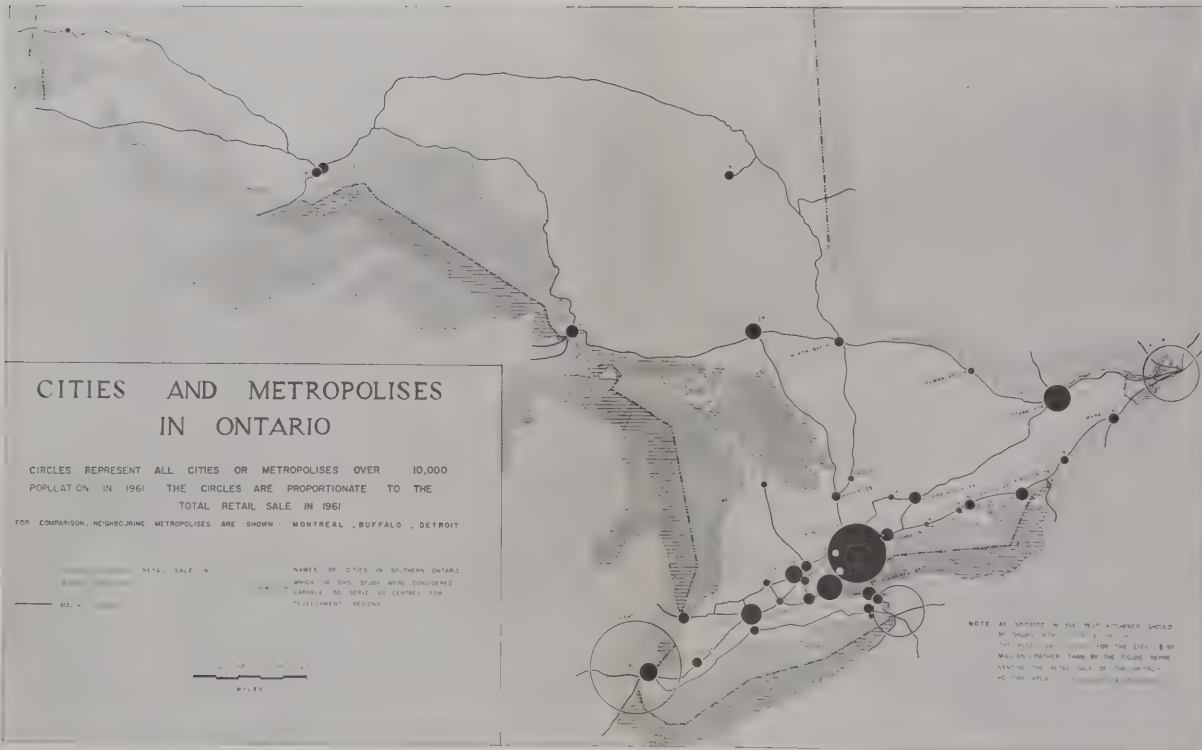
FOR COMPARISON, NEIGHBOURING METROPOLISES ARE SHOWN - MONTREAL, BUFFALO, DETROIT

NOTE: SALE IN

NAMES OF CITIES IN SOUTHERN ONTARIO  
WHICH IN THIS STUDY WERE CONSIDERED  
LARGE ENOUGH TO SERVE AS CENTRES FOR  
"DEVELOPMENT" REGIONS



NOTE: AS INDICATED IN THE TEXT, FIGURES SHOULD  
BE SHOWN IN THE FOLLOWING ORDER:  
1. THE RETAIL SALE FOR THE CITY, \$ 97  
2. WILL ON, RATHER THAN BY THE FIGURE BEING  
STATED THE RETAIL SALE OF THE METRO-  
POLITAN AREA.

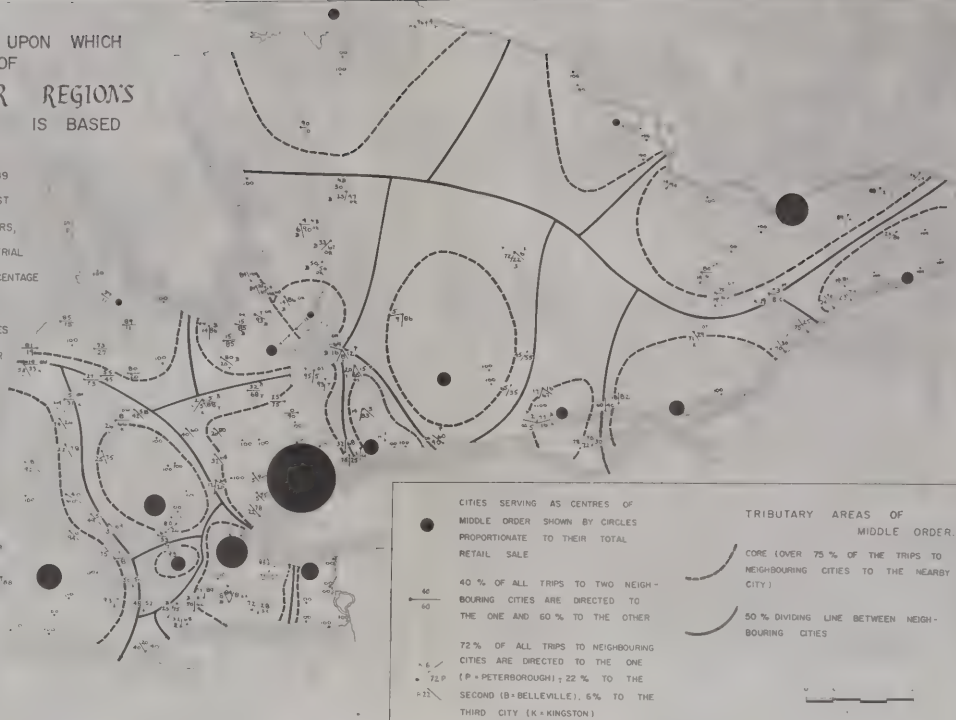






ANALYTICAL DATA UPON WHICH  
THE DELIMITATION OF  
MIDDLE ORDER REGIONS  
IS BASED

DATA OBTAINED FROM 349  
QUESTIONNAIRES WHICH LIST  
ESTIMATES MADE BY MAYORS,  
REEVES, CLERKS AND INDUSTRIAL  
SPOKESMEN AS TO THE PERCENTAGE  
OF TRIPS MADE BY THEIR  
COMMUNITY TO MAJOR CITIES  
(OF MIDDLE AND HIGH ORDER  
CENTRAL FUNCTIONS)





[illegible]

DATA OBTAINED FROM 349  
QUESTINNAIRES WHICH LIST  
ESTIMATES MADE BY MAYORS,  
FEEVER CLERKS AND INDUSTRIAL  
WORKSMEN TO THE PERCENTAGE  
OF TRAPS MADE BY THEIR  
COMMUNITY TO METROPOLITAN  
CENTRES (OF HIGH ORDER  
(CENTRAL FUNCTIONS)

METROPOLISES SERVING AS CENTRES  
OF HIGH ORDER SHOWN BY CIRCLES  
PROPORTIONATE TO THEIR TOTAL  
RETAIL SALE

70% OF ALL TRIPS TO THE MOUNTAIN  
BOARDS WITHIN THE LAST ONE HUNDRED  
71 THE ONE AND A HALF PER CENT OF THE TRIP

VIETNAMESE ARE REPORTED TO THE  
LINE, 1 TORINTO, 57% TO THE  
SECOND LINE, 10% TO THE THIRD,  
METROPOLIS, 11% HAMILTON

TRIBUTARY AREAS





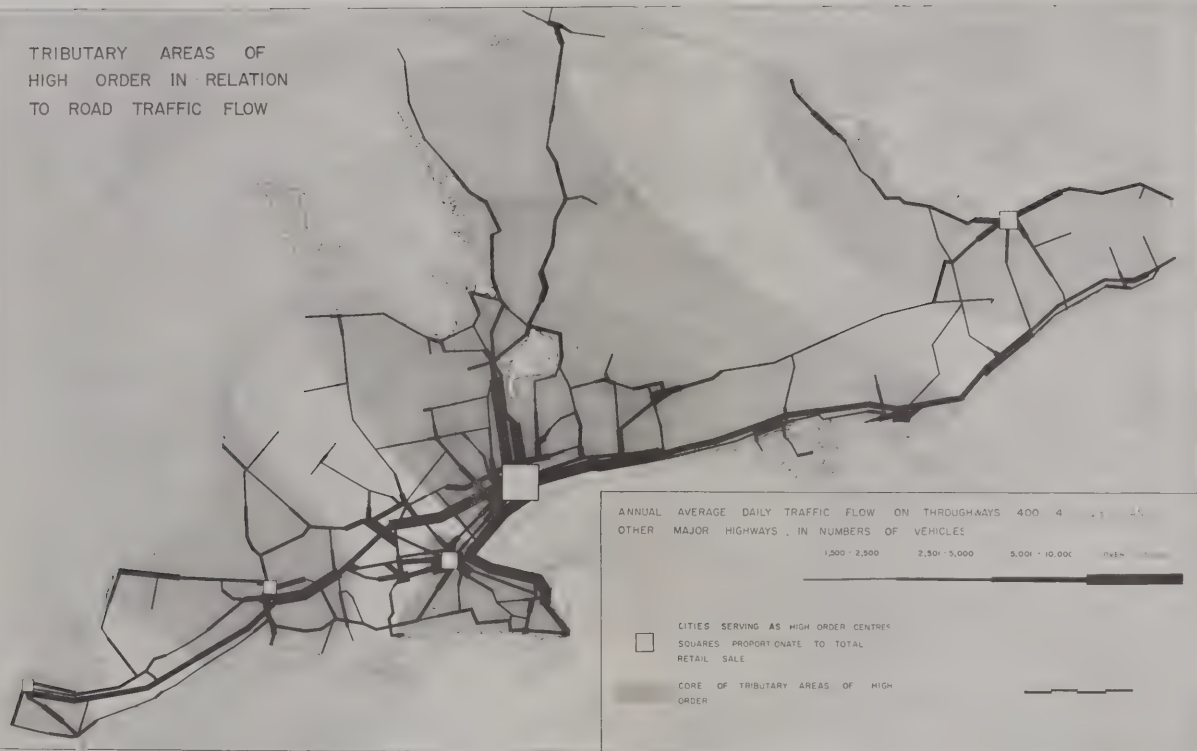
© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 399–406

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TRIBUTARY AREAS OF  
HIGH ORDER IN RELATION  
TO ROAD TRAFFIC FLOW





# FUNCTIONAL REGIONS OF HIGH AND MIDDLE ORDER

FOR POTENTIAL CENTRES OF DEVELOPMENT REGIONS

## URBAN CENTRES :



HIGHEST ORDER CENTRE



HIGH ORDER CENTRES :



UPPER HIGH



MIDDLE HIGH

LOWER HIGH

MIDDLE ORDER CENTRES :



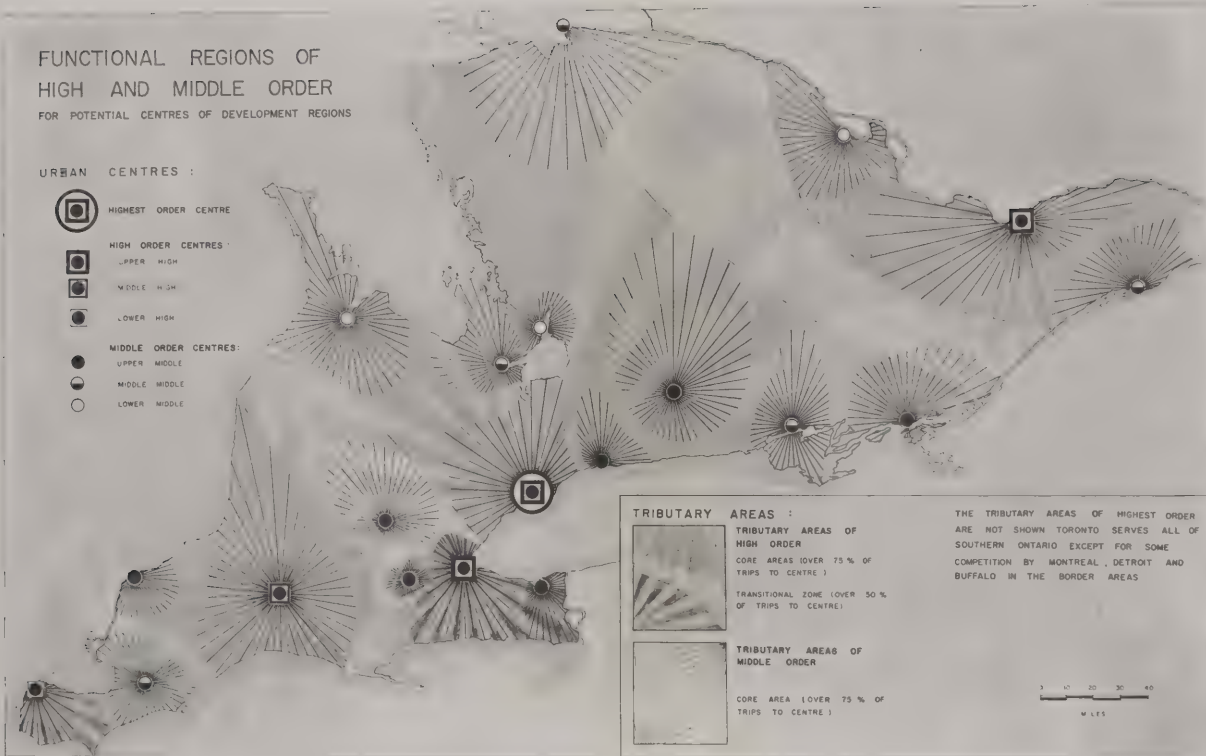
UPPER MIDDLE



MIDDLE MIDDLE



LOWER MIDDLE



## TRIBUTARY AREAS :



TRIBUTARY AREAS OF  
HIGH ORDER

CORE AREAS (OVER 75 % OF  
TRIPS TO CENTRE)

TRANSITIONAL ZONE (OVER 50 %  
OF TRIPS TO CENTRE)



TRIBUTARY AREAS OF  
MIDDLE ORDER

CORE AREA (OVER 75 % OF  
TRIPS TO CENTRE)

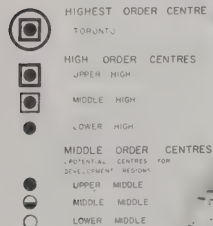
THE TRIBUTARY AREAS OF HIGHEST ORDER  
ARE NOT SHOWN. TORONTO SERVES ALL OF  
SOUTHERN ONTARIO EXCEPT FOR SOME  
COMPETITION BY MONTREAL, DETROIT AND  
BUFFALO IN THE BORDER AREAS

0 10 20 30 40

MILES



# FUNCTIONAL REGIONS OF MIDDLE ORDER AND POPULATION DISTRIBUTION





[illegible]

GRENVILLE COUNTY, 22,864 PEOPLE,  
464 SQUARE MILES, SHOULD BE  
SUBTRACTED FROM KINGSTON/TORONTO  
REGIONS AND ADDED TO CORNWALL/  
OTTAWA REGIONS





[illegible]

400 王 强



"ECONOMIC" REGIONS IN  
RELATION TO "FUNCTIONAL"  
REGIONS OF MIDDLE ORDER

